

Senators Place Approval on S-11 Trade Amendment

**Bill Removes Defense That
Price Reductions Were Made
Because of Competition**

By JOHN CIPPERLY
Croplife Washington Correspondent

WASHINGTON — The Kefauver-Patman amendment to the Robinson-Patman Act to end legal defense against violations of the law on the grounds of meeting competition—widely known on the Senate side as S-11, gained Senate judiciary approval last week covering only food, drug and cosmetics which would be used in human foods or applications.

Presumably this limitation would exclude sales of fertilizer or pesticidal chemicals since they would not properly be seen as used in food, drugs, or cosmetics for human purposes.

The purpose of this bill is to deny to manufacturers, the defense under

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April Inorganic Output Decreases from March

WASHINGTON — April output of synthetic anhydrous ammonia totaled 329,837 short tons, compared with 339,015 short tons in March, the Bureau of the Census reports. Production of ammonium nitrate, original solution, during April amounted to 231,228 short tons, down from 240,785 short tons the previous month.

April production of nitric acid totaled 235,477 short tons, compared with 242,097 short tons in March. Phosphoric acid production in March was 157,076 short tons, compared with 155,192 short tons in March, and April sulphuric acid output totaled 1,296,892 short tons, down from 1,363,696 short tons in March.

DDT Trial Judge Declares Mass Spray Projects to be Harmless

NEW YORK—DDT came out of court on June 23 cleared of charges ranging from the ability of that insecticide to cause leukemia to its toxicity to oysters—and many additional charges in between.

Three and a half months after the trial wound up, Walter Bruchhausen, Federal Judge, handed down his history-making decision that as far as the court was concerned, mass sprayed DDT lived up to none of its alleged damages to human, animal, aquatic, or vegetable life.

Court action was instituted by residents of Nassau and Suffolk counties

on Long Island. Besides attempting to restrain spraying operations, these residents charged that mass sprayings against the gypsy moth were injurious to health, property, and wildlife. The non-jury trial was held in U.S. District Court, Brooklyn.

In the spring of 1957, three million pounds of DDT were sprayed on parts of New York, New Jersey, and Pennsylvania. Operations were carried out jointly by USDA and the states concerned.

In handing down this decision, Judge Bruchhausen noted that the

plaintiffs had "failed to establish that the subject spraying was injurious to health." He further noted that some of the witnesses were so strongly in favor of so-called organic farming, their judgments may have influenced their leanings.

As to the effects of DDT on crops and wildlife, octogenarian Judge Bruchhausen asserted that "evidence of spraying programs throughout the country demonstrates that the fish, bird, and bee loss has been inconsequential . . . there is no proof that DDT injures plants . . . (or) absorbs it from the soil and transfers to edible portions."

The Federal Judge suggested to defendants that more intensive planning, preparation, and caution be exercised when spraying a highly developed and built-up section than when spraying woodlands in more isolated areas.

Shortly after the decision was handed down, at least one newspaper in Metropolitan New York severely criticized Judge Bruchhausen's opinion. That paper claimed the court had brushed aside plaintiffs' testimony as "untrue or wholly exaggerated." The newspaper urges appeal of the case.

Reliable sources say that the decision probably will be appealed.

"It would seem," the judge wrote in his lengthy opinion, "that the plaintiffs' major complaint is of annoyance rather than damage."

Concluding the court's remarks, the judge stated, "The rights of the individual are not limitless. Individuals must yield to the requirements of the public as a whole . . . the spraying clearly is in the public interest . . . and thus is within the proper exercise of the police power by designated officials."

USDA alone or jointly with states

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Senate-Approved Bill Shows Way to Greater Sales Volume

By JOHN CIPPERLY
Croplife Washington Correspondent

WASHINGTON—A Senate agriculture committee-approved bill last week, now given the approval of Ezra Taft Benson, secretary of agriculture, will if adopted by Congress, paint an agricultural economy picture for the coming year which can design a broad sales pattern for fertilizers and pesticidal chemicals.

This bill will probably take precedence over any agriculture legislation the House can pass and gain White House approval.

In fact, it was told to Croplife here last week that the Senate committee bill had gained approval by Secretary Benson if there were not major changes when the committee bill reached the Senate floor.

That same condition does not apply to the House agriculture committee's over-all omnibus bill which has been declared off-limits by Secretary Ben-

son and if the House measure is passed by Congress, it will be vetoed.

All emphasis now turns to the Senate initiative which has produced a bill of major concessions both by Congress and Secretary Benson.

This Senate measure is likely to be

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USDA CONSUMPTION REPORT 1956-57 . . .

Sales of Materials Boost Fertilizer Use 1.7%

WASHINGTON — Fertilizer consumption in the U.S., District of Columbia, Hawaii and Puerto Rico totaled 22,709,011 tons in the fiscal year ended June 30, 1957, according to the annual report just issued by the U.S. Department of Agriculture. The consumption figure for the year showed an increase of 515,041 tons over that of the 1955-56 period, or a gain of 1.7%.

The current report was compiled by Walter Scholl, Marion M. Davis, Florence B. Crammatte, Esther I. Fox and Anna W. Woodward. Similar tabulations have been issued for the past 18 years. The statisticians are associated with the fertilizer investigations research branch, soil and

water conservation research division, Agricultural Research Service of USDA, located at Beltsville, Md.

Total quantities of fertilizers consumed in the past fiscal year are presented in Table 1. These include secondary and trace nutrient materials.

The 1956-57 consumption of fertilizers comprised 21,765,768 tons of products containing one or more of the primary nutrients, and 943,243 tons of the secondary and trace nutrient materials which did not contain N, P₂O₅, or K₂O. While the quantity of fertilizer containing primary nutrients was 1.7% above that recorded in 1955-56, consumption of the secondary and trace nutrient mate-

rials was 153,638 tons (19.5%) above the quantity (789,605 tons) used in the preceding year.

The changes in consumption of the classes of fertilizers containing primary nutrients from 1955-56 are summarized by regions in table 2.

Unlike the year 1955-56 when consumption of fertilizers in most of the regions was lower than in 1954-55, consumption in 1956-57 was higher than in 1955-56 in all but a few regions. In the few exceptions where consumption was lower, the amount of decrease was usually not as great as occurred the previous year. Consumption of mixtures in the South Central region

has continued to decrease which was offset, in part, by a higher use of materials. Only in the Pacific region has consumption of both classes increased and in the South Atlantic region decreased in the two years, respectively.

Consumption of fertilizers containing primary nutrients increased in 36 of the tabulated areas and decreased in 15 (table 3). In comparison with consumption in 1955-56, increases ranged up to 37% for Montana while decreases ranged downward to 20% for Oklahoma. In tabulated areas showing increased consumption, the average was 6.0% while in those

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Jacob White

Jacob White to Head Nitrogen Division

NEW YORK—Jacob White has been named president of the Nitrogen Division, Allied Chemical Corp., to take over the office vacated by Hugo Riemer in May.

The new president is a native of New Jersey and has been with Allied in various capacities since 1921. His previous position, held since 1953, was that of vice president of the Nitrogen Division. The year before, he had been assistant to the president of the division.

Allied Chemical also announced that William H. Winfield has been made president of Allied's International Division, both appointments becoming effective July 1, 1958. The announcements were made by Glen B. Miller, Allied president.

Central Farmers Names Two; Announces Consolidation

CHICAGO—Central Farmers Fertilizer Co. has announced the appointment of Avery L. Stutts as manager of its phosphate works being constructed in Georgetown Canyon. Jos. J. Lanter, president of Central Farmers, also announced new responsibilities of Charles M. Miller, and confirmed the consolidation of Central Farmers with the Western Fertilizer Assn., adding Pacific Northwest agricultural cooperatives to the Central Farmers organization.

Mr. Stutts for the past seven years has lived at Pocatello, Idaho, where he was associated with Westvaco Chemical Co. He has also had experience with the Olin Mathieson Chemical Co., and prior to that with Tennessee Valley Authority, which developed much of the process being incorporated in the Central Farmers plant.

Mr. Miller's new assignment is that of materials manager, a newly created position. He will direct the company's mining, phosphate rock processing, and finished product shipping activities and will also coordinate the company's services to the five new members of Central Farmers, resulting from the consolidation.

The new members are Washington Farmers Cooperative Assn., Pacific Supply Cooperative, Utah Poultry and Farmers Assn., Utah Cooperative Assn., and Grange Cooperative Wholesale. This group of cooperatives distributes fertilizer and other farm production supplies in Washington, Oregon, Idaho, Montana, and Utah.

L. A. OLSON RETIRES

STATE COLLEGE, MISS.—L. A. Olson retired June 30 as contact officer between the Tennessee Valley Authority and Mississippi State University, according to Dr. Clay Lyle, extension director, and M. S. Shaw, associate extension director.

Oregon Field Day Emphasizes More Grass, More Beef, More Profit

BURNS, ORE.—Seven keys to better grass production on eastern Oregon rangelands were emphasized at the recent Squaw Butte-Harney branch experiment station's 10th annual field day. Located 45 miles west of Burns, the station is operated jointly by Oregon State College agricultural experiment station and the U.S. Department of Agriculture Agricultural Research Service.

Improved range management, a new grass seeder for rangelands, fertilizing crested wheatgrass, forecasting range production, sagebrush and rabbitbrush control, early harvest of rye hay and crested wheatgrass seeding were main approaches for "more grass, more beef and more profits," outlined by research workers.

Another highlight of the program was a report that crested wheatgrass yields could be doubled with application of 30 lb. of actual nitrogen per acre.

Fertilizer not only boosts yields but improves feed quality, it was reported. Fertilized wheatgrass averaged 4% higher "crude protein content" than unfertilized wheatgrass through May and June. Another bonus from fertilizing: It helps keep sagebrush from coming back.

Control of sagebrush with aerial spraying of 2,4-D is giving a 30 to 40% annual return on the investment, it was reported. Station trials show that spraying with 1½ lb. 2,4-D ester per acre costs \$2.50 to \$3 an acre, lasts for at least 10 years, and returns \$1 or more per acre per year in increased beef production.

Rabbitbrush control requires double the dosage of 2,4-D ester (3 lb. per acre), but the important thing is "timing", researchers stated. Most all successful results on rabbitbrush have been obtained by spraying in June except in very dry years. Big sagebrush is killed easily a month earlier.

Spencer Forms New Foreign Subsidiary

KANSAS CITY—Formation of Spencer Chemical International, Inc., as a wholly-owned subsidiary for the conduct of foreign trade operations has been announced by Spencer Chemical Co. The new organization has been incorporated in the Republic of Panama and will conduct worldwide sales operations involving all exportable Spencer products not covered by existing sales contracts.

Kenneth A. Spencer, president of Spencer Chemical Co. and chairman of the board of the new corporation said, "The growth and diversification of Spencer Chemical Co. have made necessary the setting up of a separate organization which can efficiently centralize and coordinate the sale of Spencer products abroad. Spencer Chemical International will operate as a separate corporate entity and will have its central office in Panama City."

Mr. Spencer announced that the officers of the company would be: G. Maynard Jenkins, formerly head of the parent company's foreign department, president; J. E. Culpepper and Albert Slingerland, vice presidents; Richard Cahill, secretary and treasurer and E. F. McGill, assistant secretary.

Mr. Slingerland will become the European representative for Spencer International. A native of the Netherlands and a resident of the Hague, he was also associated for many years with the foreign activities of the N. V. Hercules Powder Co. prior to joining Spencer. Mr. Cahill, a resident of Panama City, will manage the corporation's central offices in that city.

Plant Management Changes Announced by Swift

CHICAGO—Swift & Co., agricultural chemical division, will make changes in the management of five plant food factories June 30, according to W. F. Price, general manager.

R. H. Woodward, now of the Chicago general office staff, becomes manager of the Atlanta, Ga., division and E. H. Rappe, formerly manager of the Atlanta plant, moves to Columbia, S.C., as manager.

Alf H. Oines, also of the Chicago staff, assumes management of the Baltimore, Md., division succeeding A. W. Langdon who is transferred to Calumet City, Ill.

John A. Silkman, assistant manager at N. S. Yards, Ill., becomes manager at Shreveport, La. succeeding W. L. Gray who is transferred to Tyler, Texas, as manager of the East Texas Products Co. division while R. M. Cole, acting manager at Tyler, will join the Chicago staff.

Work on California Ammonia Plant Proceeds on Schedule

LATHROP, CAL.—Work on the new NH₃ plant being erected by California Ammonia Co. is proceeding on schedule, Lowell W. Berry, chairman of the board, told a meeting of former-directors here recently. Completion of the plant is scheduled for November.

Mr. Best said that the compressors for the plant are undergoing final assembly at Painted Post, N.Y., and will be delivered in July. Shipment of the air separation plant, which was built in Montreal, was to begin in mid-June. The ammonia reactivating tower and heat exchangers have been completed in Los Angeles.

California Ammonia Co. is a joint enterprise owned by more than 700 California farmers and The Best Fertilizers Co. The plant is being built under the supervision of Best and after completion Best will manage the plant.

SEED PLANT

GRANGEVILLE, IDAHO—Work recently started on a \$40,000 seed processing plant for the Grangeville Union Warehouse and Supply Co. here. The three-story unit is to be completed by Aug. 1.



George J. Urbanis

IMC APPOINTMENT—International Minerals & Chemical Corp. has announced the appointment of George J. Urbanis as district sales manager of its phosphate chemicals division in charge of a territory extending into New England, the Mid-Atlantic states, Ohio and Canada. Mr. Urbanis was in sales work with the J. B. Ford division of Wyandotte Chemicals Corp. before joining International in November, 1955, as a sales representative in the Pittsburgh area. A graduate of the University of Wisconsin with a B.A. degree in 1949, Mr. Urbanis was in the U.S. Marines from 1942 to 1945.

Virginia Field Days

BLACKSBURG, VA.—The schedule for the summer and fall field days at the Virginia Polytechnic Institute research stations has been announced here. It includes the following sessions:

July 25, Bright Tobacco Research Station, Chatham; Aug. 8, Southside Research Station, Charlotte; Aug. 11-14, Tidewater Research Station, Holland; Aug. 13, Southwest Virginia Research Station, Emory; Aug. 15, Shenandoah Valley Research Station, Steeles Tavern; Sept. 11, Northern Virginia Pasture Research Station, Middleburg, and Oct. 1, Eastern Virginia Research Station, Warsaw.



OFFICIAL CONSERVATION—Gov. Luther H. Hodges, North Carolina, left, discusses potato growing with Dr. R. H. Wellman, manager of the Crag agricultural chemicals department, Union Carbide Chemicals Co., center, and E. E. Fogle, president of the company. Governor Hodges and more than 100 North Carolina agricultural officials and local businessmen recently were guests of Carbide on a guided tour of the company's 142-acre research farm 17 miles southeast of Raleigh. The farm is being used principally for experimental work on Carbide's newest weed killers, fungicides, and insecticides. Guests were told that the Raleigh farm is playing a leading role in speeding development of many agricultural chemicals.

Southern States Makes Changes in Personnel

RICHMOND, VA.—Several changes in Cooperative Seed and Farm Supply Service affecting farm supply purchasing and warehouse management have been announced by Southern States Cooperative here.

K. R. Cline has been named manager of the reorganized farm supply procurement department. Joel W. Dinwiddie, manager of the Roanoke branch of Cooperative Seed and Farm Supply Service, is moving to the central offices and will be in charge of procurement of building supplies, farm tools and mechanical equipment. Paul Cornett, manager of the Richmond branch, succeeds Mr. Dinwiddie at Roanoke. W. B. Osborne succeeds Mr. Cornett at Richmond.

The farm supply purchasing department is being reorganized to include an over-all manager of farm supply procurement, three individual farm supply procurement managers, one departmental engineer, to be named later, and one assistant to the commodity procurement managers.

As head of the department, Mr. Cline also will retain the responsibility for the purchasing of a limited group of commodities. Assisting him, in addition to Mr. Dinwiddie, will be J. F. Hanley, in charge of procurement of agricultural chemicals and lawn and garden supplies, and L. J. Wieber, automotive, paint and hardware. Douglas Ailsworth will continue as assistant to farm supply procurement managers.

ARIZONA BULLETINS

TUCSON—Two bulletins of interest to Arizona's irrigation farmers have been released by the University of Arizona's College of Agriculture. One—"Johnson Grass Control"—covers the newer herbicides used to control this grass which is the No. 1 weed enemy along the ditchbanks and field edges of irrigated crops. The second bulletin is "The Spotted Alfalfa Aphid in Arizona." It traces the history and present status of this worst insect pest of alfalfa in the Southwest.



Anthony DePhillips

Diamond Names New Assistant Branch Manager

PHILADELPHIA—Appointment of Anthony DePhillips as assistant branch manager of the Philadelphia branch sales office of Diamond Alkali Co., Cleveland, Ohio, has been announced by William H. McConnell, vice president—sales.

Mr. DePhillips, who has already assumed his new responsibilities, succeeds the late George J. Soren.

A member of the company's Philadelphia sales staff covering the Baltimore, Maryland, area since 1937, Mr. DePhillips has been associated with Diamond in a sales capacity for nearly 30 years, having joined the company in 1929.

Fertilizer Needed for Development of Meyer Zoysia Turf, USDA says

WASHINGTON—Fertilizer is as necessary for the development and maintenance of Meyer zoysia lawns as it is for lawns of other turf grasses, the U.S. Department of Agriculture advises.

Field observations by scientists of USDA's Agricultural Research Service indicate that Meyer zoysia, a warm season grass, will grow and persist over a wide range of soil types and at very low fertility levels. However, these field trials show the grass can be expected to perform more satisfactorily and develop a better turf in less time when soil pH is about neutral and adequate amounts of plant nutrients are used.

Meyer zoysia has been promoted for the past several years in a manner that suggests it is the answer

to all lawn problems. This promotion has created the impression that it is a miracle grass, capable of producing satisfactory turf on any kind of soil with little or no fertilization, USDA said.

Greenhouse and field tests by Dr. Felix V. Juska, research agronomist of the USDA Crops Research Division, prove that nitrogen is the most important element for rapid top and runner growth and root development of this grass. Phosphorus and potassium are also important for rapid growth of roots, runners, and top.

In addition to an initial spring application of 30 lb. of a complete fertilizer (10-10-10) per 1,000 square feet, Meyer zoysia lawns should be given monthly applications during the summer of additional nitrogen fertilizer amounting to a total of 3 to 5 lb. per 1,000 square feet.

Such a fertilizer treatment is adequate for many soils where establishment of Meyer zoysia from either

springs or plugs is desired. A similar fertilizer program can be used to maintain established zoysia lawns. Although Meyer zoysia will grow on acid soils, a soil pH of 6 to 7 was found necessary for best response to applied plant nutrients.

Heads Seed Group

PORTLAND, ORE.—Fred Trullinger, Portland Seed Co. manager, was recently elected Pacific Seedsmen's Assn. president at the group's 32nd annual meeting at Los Angeles. He succeeds Earle Humphries, Aggeler & Musser Seed Co., Los Angeles. Mr. Trullinger, long active in trade circles, was formerly vice president of PSA and is retiring Oregon Feed and Seed Dealers president.

AGRONOMIST DIES

STATE COLLEGE, PA.—Albert E. Cooper, professor of agronomy at Pennsylvania State University, died recently at the age of 53.

"My Customers prefer Phillips 66 Ammonium Nitrate"

—Marvin Blair, King City Elevator, King City, Missouri



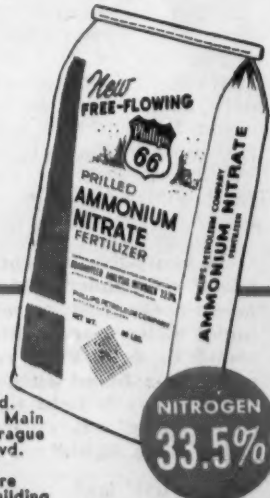
Marvin Blair (left) is a successful fertilizer dealer, serving farmers in Gentry and De Kalb counties in Missouri.



Mr. Blair says: "As a mixed fertilizer dealer selling supplemental nitrogen, I'm sold on the new uniform quality, storability and spreadability of the new Phillips 66 Ammonium Nitrate. My customers prefer it."

The outstanding performance of new free flowing Phillips 66 Ammonium Nitrate is winning new customers for other dealers, too. Their farm customers have discovered that the uniformly round, hard and dry prills provide free flowing application . . . no clogging or caking . . . for more uniform crop response.

Dealers get other extras, too, when they handle Phillips 66 Ammonium Nitrate. Consistent, convincing advertising of Phillips 66 Ammonium Nitrate in leading farm papers, personal service from Phillips 66 field men, and prompt deliveries are included in the profitable benefits of selling Phillips 66 Ammonium Nitrate. Order your supply of Phillips 66 Ammonium Nitrate today.



Proof of Performance: Users of new Phillips 66 Ammonium Nitrate find it easier to store and spread . . . the result of an exclusive Phillips 66 process that gives hard, dry and uniformly round prills that prevent caking and clogging in the applicator.

PHILLIPS PETROLEUM COMPANY

Phillips Chemical Company, a Subsidiary, Bartlesville, Oklahoma

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CHICAGO, ILL.—7 South Dearborn St.	NEW YORK, N. Y.—80 Broadway	TAMPA, FLA.—3737 Neptune St.
DENVER, COLO.—1375 Kearney St.	OMAHA, NEB.—3212 Dodge St.	TULSA, OKLA.—1708 Ulfica Square
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INSECT, PLANT DISEASE NOTES

Grasshoppers Continue to Threaten Crops In Large Areas of Wyoming and Canada

CHEYENNE, WYO.—About 50,000 acres of land in Wyoming will be sprayed for grasshopper control this year, William Chapman, state agriculture commissioner, reports.

Mr. Chapman says a survey of all areas is being undertaken by state and federal agencies to determine grasshopper density. Hardest-hit areas in Wyoming at present are north of Ft. Laramie where about 30,000 acres are affected, and 20 miles northeast of Lusk where some 40 sections are heavily infested.

Mr. Chapman says Wyoming's hopper infestation is below normal, but the hoppers are still hatching. Additional affected areas in the state are the northeast corner of Campbell County and the northeast corner of Sheridan County.

Canada Expects 'Hoppers

WINNIPEG—Grasshoppers will hit 31,000 square miles in the prairie provinces of Manitoba, Saskatchewan and Alberta, according to a forecast made by the Canada Department of Agriculture. The threat will be greater than last year as the insects continue to grow in numbers, a trend noted in the department's 1957 forecast.

Saskatchewan is expected to be hardest hit; the problem will be a little more serious in Alberta but remain largely unchanged in Manitoba. Outbreaks, while higher than last year, are expected to fall far short of those in 1949 and 1950.

Reports indicate severe grasshopper attacks may be expected along parts of the international border in Saskatchewan while in Alberta, infestation is mostly confined to the south-central area. Unfavorable hatching weather in Manitoba has contributed to the unchanged situation.

One of the most dangerous species, the migratory grasshopper, is reported as recovering noticeably in recent years after hitting a low level in 1953.



Insect Activity Reported as Light in Indiana Area

VINCENNES, IND. (June 24)—Insect activity in orchards around Vincennes is light due to the cool weather and the fact that we are between broods for many of the major fruit pests. On apples, green aphids continued to be abundant in some orchards and adult red-banded leaf rollers continued to lay eggs so that second-brood larvae are expected to increase about June 30. Injury by mites continued to be light.

In peach orchards populations of stink bugs jarred from peach trees was greater on June 23 than for the previous five weeks. Oriental fruit moth adults were active during the period. Second-brood worm injury by fruit moth has been light to date.

A message from LaPorte, Ind., dated June 18, summarized insect activity in that area as follows:

"Seventy-five percent of the first-brood red-banded leaf rollers were larvae; the rest were pupae. No pupal skins nor adults had been found to date. First codling moth entry was found June 15. Codling moth injury is light to date. Third cover spray was started June 18. Mites were light."

Unspotted leaf miner injury on

apple leaves submitted to this laboratory from the LaPorte, Ind. area was apparently caused by this insect. —D. W. Hamilton.



English Grain Aphid Numerous in Minnesota

ST. PAUL, MINN.—Reports of high populations of English grain aphid have come from the northwest and west central districts and also scattered reports from other districts. Surveys this past week indicate a marked increase in aphid populations on barley, wheat, oats and rye. The English grain aphid population can increase during cool weather conditions and are not held in check by the more slowly developing predator populations.

In Red Lake, Pennington, Norman and Clay counties, predator numbers are extremely low, which may account for the high populations of aphids. Counts range from 20-300 aphids per linear foot of row. There is an extreme variation between fields so it is advisable for each farmer to check his own grain fields. This aphid can multiply quite rapidly and close observation should be made daily.

Pupation is nearly completed in all districts. Moths have emerged in high numbers with some egg laying occurring in the southern counties. Corn is behind in borer development and it is not known at this time what the larval survival will be this year.

Winged forms of sweetclover aphid have been present since at least May 29 in the Crookston area and dispersal to new seedings is evident. Heavy infestations have been found in two second year stands—one near Ada and one at Beltrami. Moderate to heavy infestation is developing on a new seeding near the Beltrami field. Infestations on new seedings sampled in the Fertile area were light.

Two-striped grasshoppers (*Melanoplus bivittatus*) development is closely associated with soil type in northwest district. Hatching is general on light sandy soils with 50 to 60 first to third instar nymphs per square yard in roadsides reported in central Polk County. 20-30 nymphs per square yard in poor stands of alfalfa. Heavy nymphal populations were observed on light soils in Roseau County where 20-30 first to third instar nymphs per square yard were observed in margins and thin stands of alfalfa at several places in county. Kittson County—30 to 40 first and second instar nymphs were observed near Lancaster in weeds and clover in soil bank fields. On heavier soils in Polk, Pennington, Red Lake, Marshall, Roseau and Kittson *M. bivittatus* range from eye-spot to very light hatching with very low nymphal populations. (Actually a few warm days could step up the development.)

The red-legged grasshopper (*Melanoplus femur-rubrum*) ranges from coagulated in some of the heavy wet soils to the eye-spot stage on the lighter soils. A heavy 'hopper hatch was reported in southern Blue Earth County on a field margin. Movement into soybeans noted with heavy feeding up to a rod into the field.

Meadow spittlebug (*Philaenus leucophthalmus*)—reported in Houston County on alfalfa and red clover. It appears to be quite general throughout the county. This is the

first report in recent years of economic infestation by this pest that has come to our attention.

Wireworms reported in corn in Stevens County. A 30 acre corn field has spotted infestations with a reduction of about 10%-20% of the plants.

Armyworm moths (*Pseudaletia unipuncta*) in small numbers are being taken in light traps at Fergus Falls and Crookston. No infestation reported in grain or grasses.

Planes Battle Spruce Budworm in Oregon

BAKER, ORE.—Two groups of planes have started waging a battle against spruce budworm in Oregon's Malheur National Forest.

Some 14 planes took part in the spraying program with one group operating out of John Day in the Blue Mountains of eastern Oregon and the other out of this city, according to Benton Howard, U.S. Forest Service project director.

Mr. Howard said strict control of the flying is being exercised to minimize the concentration of DDT on all streams and lakes. "We will leave out the spray swath immediately adjacent to fish-producing streams," he said.

Seven of the spray planes are PBYS, in use for the first time over the Pacific Northwest forests. Three observation planes on each unit, with trained observers, will watch spray patterns, wind drift of the spray and height of flight over ground cover. Additional weather observers are located on the ground.

The area scheduled for spraying amounts to 820,000 acres containing an estimated 3,400,000,000 board feet of timber having a log selling value of about \$20,000,000 and a lumber value of approximately \$242,000,000.



Pea Aphids, Other Pests Prominent in Wisconsin

MADISON, WIS.—Pea aphid counts have averaged as high as 50 per sweep in early peas in Brown County with single sweeps being as high as 150. Pan counts averaging 25-35 aphids per pan were observed in Green Lake County on all peas, with the late peas having the higher averages. Diseased aphids have been noted but their numbers are insignificant at this time. Early peas in St. Croix County had an average of 9 pea aphids per sweep on June 12, while in late peas (2" to 6") there was an average of 2 colonies per 10 plants.

Painted lady butterflies, *Vanessa cardui*, have been observed on Canada thistles and their larvae (worms) may present a problem in peas. These worms may become quite numerous in pea fields which have not been treated for pea aphids. A report of "worms" in a Fond du Lac County pea field has been received, but it may not be the larvae of the painted lady.

Adult alfalfa plant bugs, *Adelphocoris lineolatus*, and rapid plant bugs, *Adelphocoris rapidus* Say, were obtained while sweeping alfalfa and red clover in Richland County on June 10. Since that time, they have been observed as far north as St. Croix County.

High numbers of armyworm moths have been obtained in blacklight traps, and careful observations should be made for armyworms in small grain, corn and peas.

Pupation of European corn borer is complete in the southern portions of the state, and moth emergence has

begun as evidenced by blacklight trap catches.

Spotted cucumber beetles were observed feeding on corn plants in Trempealeau, Buffalo, Pepin, Pierce and St. Croix counties. In no instance did this infestation affect more than 3% of the plants.

Spring migrations at the University Hill Farms of grain aphids, especially English grain aphids, are coming to a standstill although several species were still found. English grain aphids are generally present in all locations investigated, however few aphids per plant on both small grain and grasses are the rule rather than large colonies. The corn leaf aphid, on the contrary, has built up large colonies in some locations on barley. A few rose grass aphids, *Macrosiphum dirhodum*, were also found on barley. Since the aphid population is much higher than last year, it is difficult to indicate the most abundant species. Lady beetle populations remained relatively low, whereas hymenopterous parasites still picked up in population. In one location 50% of a large aphid colony was found to be attacked by this parasite.

Onion maggot populations are high in southeastern Wisconsin, and heavy damage has been observed on untreated fields and on fields treated with chlorinated hydrocarbons. The first generation is complete and adults will soon emerge to begin the second generation.

Six-spotted leafhopper populations are low and uneven. Nymphs of the overwintering leafhoppers are now in the 3rd and 4th instar. The overwintering six-spotted leafhoppers are not the vectors of the virus disease, aster yellows. Nymphs of the migrating six-spotted and potato leafhopper have not been observed at the present time.

Armyworm Reported in Several Areas of Virginia

BLACKSBURG, VA.—Armyworm outbreaks are now being reported in corn, small grains, and grass crops in several counties of Virginia. Damage has been heavy in some cases, especially in corn in southwestern counties.

Farmers have been advised to check their corn, small grain, and grass crops for armyworms two or three times a week for the next two or three weeks. Much undetected damage doubtless is occurring.



Armyworms Reported in Kansas Grain Fields

MANHATTAN, KAN.—Armyworms are clipping wheat and barley heads in Cloud County, North Central Kansas. They are also cleaning off the beards and leaves of wheat, and are moving from wheat fields into corn and milo.

Cutworms continue to be pests in corn and other crops.

Severe damage from chinch bugs continues in some corn and many sorghum fields. Replanting is necessary in untreated fields in Republic and Cloud Counties.

Webworms have been causing severe damage to soybeans in Southeast and East Central Kansas counties. Reports have also been coming in about webworms on corn and sorghum as well as on alfalfa. Light webworm infestations were seen in alfalfa in Riley County (North Central Kansas). Infestations in corn and soybean fields were generally worse in weedy fields, especially pig weeds.

Some corn earworm damage in whorls of corn is showing up in the

Eastern and Southeastern areas of the state.

The white grub problem in the "flint hill" area of Geary and Riley counties remains. The grubs average seven to eight per square foot in areas where 100% of the bluestem grasses have been killed. It is not known how extensive grub infestations are in the flint hills region. The grubs are confined to these dead patches and surrounding periphery which is slightly browned, but they will work further out in all directions as necessary to get a new supply of grass roots.

Wet Conditions Ideal For Buildup of Scab

AMHERST, MASS. — Conditions are ideal for spread and buildup of secondary scab. It takes only 6 to 8 hours of wetting at temperatures of 65 to 75° for infection. Rain in the early morning hours of recent days provided the necessary wet conditions. Predicted frequent rains and showers will provide more.

In apple orchards, codling moth, green aphid and mites are now of primary concern. Because of continued low temperatures, codling moth is likely to emerge and lay eggs over an extended period. Intervals between sprays should be adjusted according to rains and predicted high temperatures. A close check upon aphid and mite buildup should be kept so as to avoid special emergency sprays.

Soaking rains at this time stimulate corn borer moth emergence. Higher temperatures at dusk result in heavy egg laying. Early and mid-season sweet corn will need continued protection against borer during the next two weeks. In late areas, this period should be extended an extra week or 10 days.

The hatching of elm leaf beetle eggs has been reported. This is later than usual but it means that elm trees should be sprayed now for best results, this year, against this leaf-chewing insect. Spruce mite is causing off-color and building a webbing in hemlock, spruce, juniper, and cedar. These plants should be checked and sprayed before damage is serious. —E. H. Wheeler and C. J. Gilgut.

No Sign of Gypsy Moth Found in New Jersey

TRENTON, N.J. — This year's gypsy moth scouting operations revealed no colonies of this dangerous forest pest in New Jersey, according to Frank A. Soraci, director, division of plant industry, State Department of Agriculture. No egg masses of the gypsy moth were found during an intensive combing of a number of suspicious locations in the northern half of the state by trained inspectors of the department. The report covers the period from October 15, 1957 to the present.

By July 1, 6,200 gypsy moth traps will have been placed at regular intervals throughout 2½ million acres of the state. Traps are located seven-tenths of a mile apart, a spacing plan which provides saturation of the area with the chemical attractant used. The traps will be regularly inspected and serviced at 10-day intervals during the summer months while the moths are in flight. The trapping area extends from the northern tip of New Jersey southward to a line running from Camden to Red Bank.

Although the population was at a low level throughout the generally infested states during 1957, Mr. Soraci said that the outbreak potential still remains. In 1953, 1½ million acres were defoliated by gypsy moth in the northeastern states. The objective of the control program is the prevention of such severe damage in the future.

Georgia Reports Presence Of Pests in Wide Area

ATHENS, GA.—Light to moderate infestations of thrips on peanuts in Houston, Dooly, Crisp, Turner, Tift, Colquitt, Mitchell, Thomas, Cook, Berrien, Irwin, Coffee, Bacon, Appling, Tattnall, Candler, Treutlen and Laurens Counties.

Heavy showers during the first two week-ends in June facilitated the escape of new Plum Curculio adults from the soil, and the emergence has been heavy, especially on June 8 and 16. There has been no second-generation egg deposition in peaches to June 16, but it can be expected any time now.

Rather heavy infestation of fall webworm on pecans at Fort Valley in Central Georgia. Larval nests with full-grown larvae numerous. Infestation moderate to heavy on pecan and hickory trees throughout Middle and South Georgia.

Light to moderate infestations of pecan nut casebearer on pecans in Houston, Mitchell and Thomas Counties.

The tobacco budworm is also in moderate to heavy infestations on tobacco in Tift, Colquitt, Mitchell, Thomas, Cook, Berrien, Coffee, Bacon, Appling, Tattnall, Candler, Treutlen and Laurens Counties. Likewise, the false tobacco budworm is in moderate to heavy infestations on tobacco in the aforementioned counties. —W. C. Johnson.

Leaching Needed to Reclaim Saline Soils

SANTA BARBARA, CAL. — The only known methods of removing salt to reclaim saline soils involve leaching by the passage of water through the soil, according to Ronald C. Reeve, U.S. Department of Agriculture engineer. He was one of several engineers of USDA's Agricultural Research Service who presented papers at the annual meeting of the American Society of Agricultural Engineers here.

Mr. Reeve reported that the reclamation of salt-affected soils depends upon the removal of excess salts or exchangeable sodium, and the restoration of favorable soil physical conditions. He discussed results of experiments conducted at USDA's Salinity Laboratory, Riverside, Cal., in cooperation with the Agricultural Experiment Stations of the 17 western states and the territory of Hawaii.

He stated that the quality of water needed for leaching and the amounts of additives required for replacement of exchangeable sodium can be satisfactorily predicted. Experiments show that about one foot of water is needed to reduce the initial salinity of one foot of soil by 80%.

Special practices to improve the physical condition of soils are often unnecessary, he said. Alternate wetting and drying, freezing and thawing, and the action of plant roots can perform this physical reclamation.

U.S. Loans Greece \$12 Million for Fertilizer Plant

WASHINGTON—The Development Loan Fund announced June 23 it has agreed to lend \$12 million to assist Greece in establishing a nitrogenous fertilizer plant under the new five-year development program of the Greek Government.

The plant, for which Greece requested U.S. assistance, will utilize the lignite deposits being mined at Ptolemais in northern Greece in one of the most underdeveloped areas of the country. It is expected to provide 1,000 jobs.

The plant will be operated by power

generated at a new thermal station being built by the Public Service Corp. of Greece to draw on the indigenous lignite deposits as a source of power.

Estimated annual production of 75,000 tons of fixed nitrogen, or the equivalent of 300,000 tons of finished nitrogen based fertilizers, is expected to meet Greece's immediate demands for this type of fertilizer. Production will include 25,000 tons each of ammonium sulphate and ammonium nitrate-cal; and 5,000 tons of liquid ammonia.

The total capacity will provide almost all of Greece's estimated requirements of 77,000 tons of fixed nitrogen by 1960. At present, virtually all of Greece's fixed nitrogen is imported. The DLF funds will assist in the financing of the foreign exchange costs necessary to construct the plant.

The loan, the first for Greece under the new DLF program, would be repayable in Greek currency over a period of 12 years. Negotiations are now proceeding to conclude arrangements for formal signing of a loan agreement.

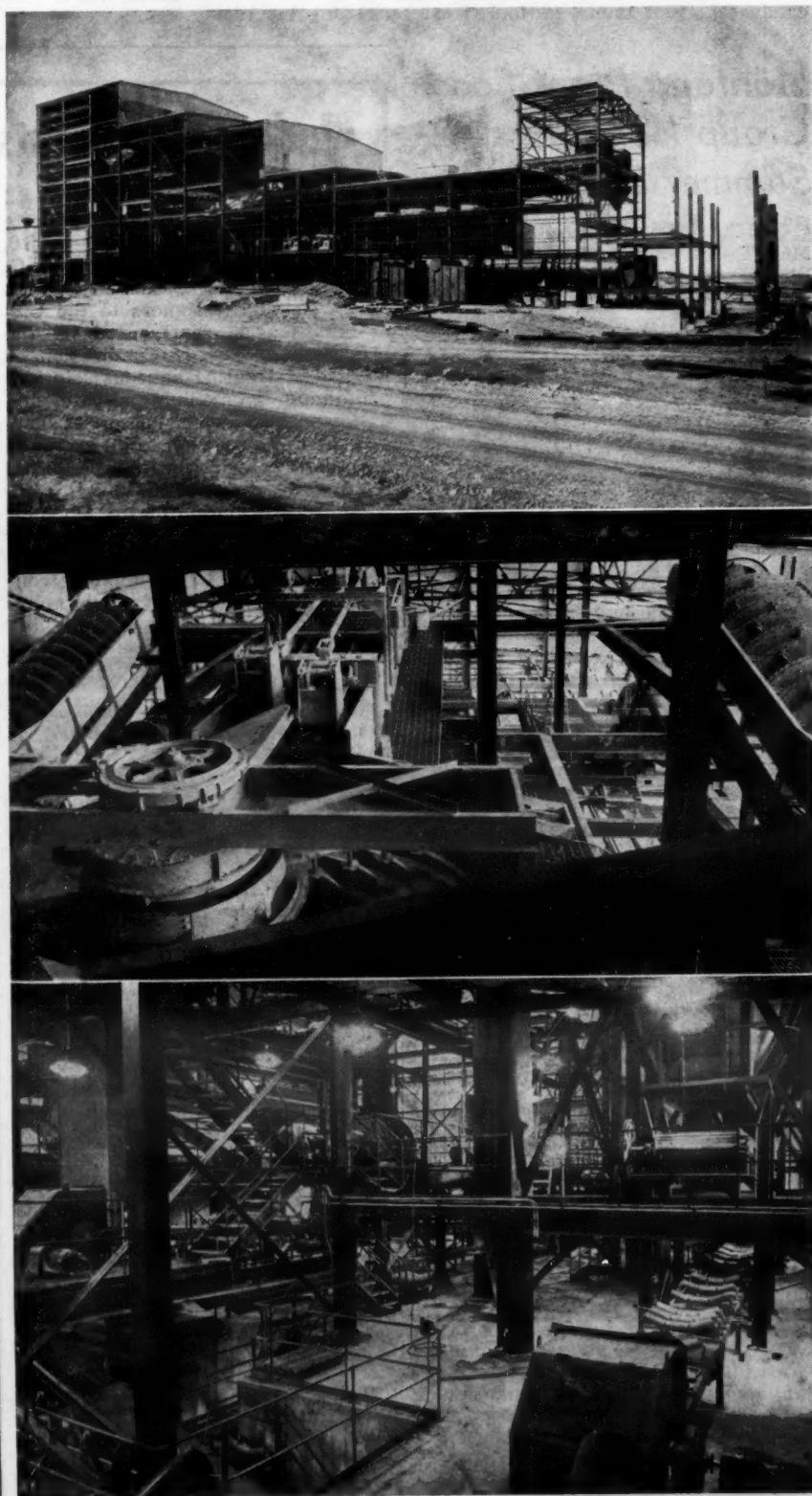
NPFI Committees Plan Chicago Meetings

WASHINGTON—Members of two National Plant Food Institute regional committees have scheduled separate meetings at the Builders' Club in Chicago during July.

A meeting of the Midwestern Research and Education Committee will be held on July 11, at which time members will formulate a program of activities for the coming year. Zenas H. Beers, Midwest regional director, is chairman of the committee.

The Midwest Industry Advisory Committee is slated to meet July 22. The group will consider recommendations for educational activities in the region for the year ending June 30, 1959. R. E. Bennett, NPFI president, and president of Farm Fertilizers, Inc., Omaha, is chairman of the committee and Zenas Beers is secretary.

The industry group held its organizational meeting in Chicago during the annual Joint Meeting of Midwestern Agronomists and Fertilizer Industry Representatives earlier.



CANADIAN POTASH EQUIPMENT—Work on the above-ground mill at the Saskatoon, Sask. location of Potash Company of America, Ltd. is progressing swiftly, officers of the firm have reported. These pictures, taken recently, show the superstructure of the new plant at top, and below, interior views of the plant, which functions to prepare raw potash for use as a fertilizer component. The firm's mine is also progressing, the shaft having reached a potash vein at a 3,303 ft. depth, on June 14. (Croplife, June 23) The above-ground facilities are expected to be completed sometime in September, while the mine itself will probably be producing ore by December, company officials have estimated.



MONTANA GROUP—Shown above are members of the Montana Plant Food Assn. who attended the recent first annual summer meeting. From left to right are Pat Devor, Occident Elevators; Homer Turner, Anaconda Co.; John D. Ross, Jr., Graham and Ross; Lyle Ekstrom, Anaconda Co.; Phil Davis, Balfour, Guthrie & Co.; Art Wol-

cott, Farmers Union Central Exchange; Warren Stenslund, Cominco; Dean Travis, Jr., J. R. Simplot & Co.; Ray McGregory, Phillips Chemical Co.; George Mason, Montana Flour Mills; Harold Martin, Van Waters and Rogers, and Dwight Ditzun, Harrisons and Crosfield.

Montana Plant Food Group Holds First Summer Session

CHICO HOT SPRINGS LODGE, MONT.—Members of the Montana Plant Food Assn. recently gathered at Chico Hot Springs Lodge, Mont., for their first annual summer meeting.

The association was formed about a year ago to promote the proper use of fertilizer in the state. One of its functions is to work closely with the college and federal authorities in helping to disseminate fertilizer recommendations to the dealers and consumers.

Dean Travis, president, acted as chairman for the two day session. Other officers include George Mason, vice president, and Ray McGregory, secretary-treasurer.

The recent survey of the National Plant Food Institute on the farmers attitude toward the use of fertilizer was discussed in detail by the group, after a slide talk by F. Todd Tremblay, Northwest representative of the NPFI, on how this survey could be used to increase the proper use of fertilizer in Montana.

A number of working committees were set up by Mr. Travis to work with the college on developing factual fertilizer information for practical use by the dealers and consumers. Members were urged by Mr. Travis to support the experiment station field days being held throughout the state.

Jesse Green gave a talk on the subject "The High Energy Bonds of Phosphorus." He discussed the importance of phosphorus in animal feeding in Montana. Mr. Green stated that "there is much evidence to show that the quality of hay and pasture depends as much upon its phosphate content as upon the percent of protein."

William H. Evans Retiring From Diamond

CLEVELAND—William H. Evans is retiring as vice president in charge of financial and shareholder relations of Diamond Alkali Co. here. He has become associated with the investment banking firm of Ball, Burge & Kraus.

Mr. Evans joined Diamond in 1937 in a sales capacity. He became a staff assistant in the sales department in 1946, and was named assistant treasurer and, later the following year, treasurer. In 1948, he was appointed manager of Diamond's sodium silicate operations. Promoted to a vice presidency in June, 1954, Mr. Evans was elected to Diamond's board of directors in December, 1955.

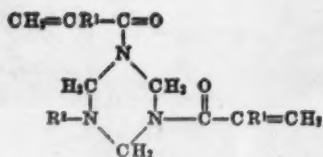
Industry Patents and Trademarks

2,838,368

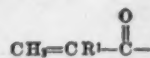
Treatment of Ammonium Nitrate Solutions. Patent issued June 10, 1958, to Thomas W. Boyer, John G. MacHutchin and Leo Yaffe, Deep River, Canada, assignors to the U.S. of America as represented by the U.S. Atomic Energy Commission. A method of treating aqueous solutions containing ammonium nitrate and fission products which comprises slowly adding the solution to an excess of hot acetic anhydride without external heating, heating the mixture to complete transformation of the ammonium nitrate, distilling the remaining mixture to near dryness and adding nitrogen dioxide to the mixture containing small volume of acetic anhydride and acetic acid while distilling the mixture.

2,838,466

Soil Stabilization with Polymerized Monomeric Triazine and Product. A composition of matter which comprises soil and the substantially water-insoluble product of the polymerization of a monomeric triazine having the formula:



in which R¹ is of the group consisting of hydrogen and methyl radicals and R² is of the group consisting of hydrogen and

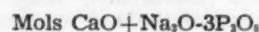


radicals in admixture with a different polymerizable unconjugated terminal ethenoid monomer having a solubility of at least 1% by weight in water at 20° C.

2,839,361

Defluorination of Phosphate Rock. Patent issued June 17, 1958, to Clinton A. Hollingsworth, Lakeland, Fla., and John C. Williams, Catasauqua, Ohio, assignors to Smith-Douglass Co., Inc., Norfolk, Va. The method of defluorinating phosphate rock which comprises subjecting the rock with a silica content of from 2 to 6% to calcination at a temperature of at least 2600° F. without substantial fusion in the presence of water vapor and of a reagent mixture consisting essentially of sodium chloride and phosphoric acid, the mol ratio of the sodium and phosphorus contents (calculated as

Na₂O and P₂O₅ respectively) of the reagent mixture being between 1.6 and 2.8 and the CaO, Na₂O, P₂O₅ and SiO₂ content of the combined phosphate rock and reagent mixture being such that the mol ratio of these constituents in the molar formula



Mols SiO₂

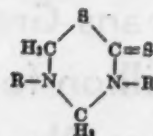
is between 1.3 and 2.8, and maintaining the calcining charge at said calcining temperature for a sufficient period of time to produce a phosphate product having high fertilizer availability and containing less than one part of fluorine for each 100 parts of phosphorus.

2,839,365

Treatment of Sulfuric Acid Sludge. Patent issued June 17, 1958, to Peter B. Murray, Swarthmore, Pa., assignor to Sun Oil Co., Philadelphia, Pa. Process for treating sulfuric acid sludge which comprises contacting sludge produced in sulfuric acid treatment of petroleum hydrocarbons with added hydrogen sulfide at a temperature within the approximate range from 40° F. to 250° F., thereby forming elemental sulfur, and separating elemental sulfur from the sludge.

2,838,380

Method of Combatting Weeds. Patent issued June 10, 1958, to Donald M. Yoder, Yonkers, N.Y., assignor to Union Carbide Corp., New York. The method of combatting weeds comprising applying to the soil containing weeds a phytotoxic amount of a compound having the structural formula



wherein R is selected from the group consisting of methyl and ethyl and both R's are the same.

2,838,438

N - (2-Pyridyl)-Tetrachlorophthalimide, Process and Use as Insecticide. Patent issued June 10, 1958, to William J. Pyne, Painesville, Ohio, assignor to Diamond Alkali Co., Cleveland, Ohio. A biologically-active composition of matter containing as an active ingredient N-(2-Pyridyl)-tetrachlorophthalimide, in a biologically active amount and a major proportion of a carrier.

2,839,375

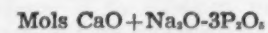
Nitrogen-Phosphorus Composition. Patent issued June 17, 1958, to Curtis G. Christian, Anaheim, Cal., assignor to Collier Carbon and Chemical Corp. The process which comprises (1) contacting elemental phosphorus with a gas mixture comprising between about 0.1 and about 5 volume percent of oxygen and at least about 5 volume percent of ammonia at a reaction temperature below about 150° C., (2) subjecting the reaction product so obtained to a temperature above about 300° C. for a period of time between about 0.05 and about 5 seconds, and (3) heating the product of step (2) with anhydrous ammonia at a reaction temperature above about 50° C. and under autogenic pressure for a period of time sufficient to effect the formation of a water-soluble amorphous solid having a total nitrogen content of about 28-30% by weight and a total phosphorus content of about 28-30% by weight.

2,839,376

Nitrogen-Phosphorus Composition. Patent issued June 17, 1958, to Curtis G. Christian, Anaheim, Cal., assignor to Collier Carbon & Chemical Corp. The process which comprises contacting elemental phosphorus with a gas mixture comprising between about 0.1 and about 5 volume percent of oxygen and at least about 5 volume percent of ammonia at a reaction temperature below about 150° C., and thereafter subjecting the reaction product so obtained to a temperature above about 300° C. for a period of time between about 0.05 and about 5 seconds, whereby there is obtained a substantially non-hygroscopic amorphous white solid product having very limited solubility in water and containing nitrogen and phosphorus in an atomic ratio of about 1.5:1.0.

2,839,377

Defluorination of Phosphate Rock. Patent issued June 17, 1958, to Clinton A. Hollingsworth, Lakeland, Fla. and John C. Williams, Catasauqua, Pa., assignors to Smith-Douglass Co., Inc., Norfolk, Va. The method of defluorinating phosphate rock which comprises subjecting the rock with a silica content not exceeding 6% to calcination at a temperature of at least 2600° F. without substantial fusion in the presence of water vapor and of a reagent mixture consisting essentially of the reaction product of sodium carbonate and phosphoric acid, the mol ratio of the Na₂O to P₂O₅ content of the reaction product being between 1.6 and 2.8, and the CaO, Na₂O, P₂O₅ and SiO₂ content of the combined phosphate rock and reagent mixture being such that the mol ratio of these constituents in the formula



Mols SiO₂

is between 1.3 and 2.8, and maintaining the calcining charge at said calcining temperature for a sufficient period of time to produce a phosphate product having high fertilizer availability and containing less than one part of fluorine for each 40 parts of phosphorus.

2,839,444

Fungicidal Composition Comprising 2,4-Dinitrofluorobenzene and Methods of Using Same. Patent issued June 17, 1958, to Waldo B. Liggett, Pontiac, Mich., and Alfred J. Kolka, Clairton, Pa., assignors to Pittsburgh Coke & Chemical Co. A soil treatment agent comprising 2,4-dinitrofluorobenzene, a solid dispersant, and a surface-active agent.

2,839,445

Fungicidal and Anti-Oxidant Compositions Comprising 1,3-Dithiolanes. Patent issued June 17, 1958, to John F. Harris, Jr., Dunlinden Acres, Del., assignor to E. I. duPont de Nemours & Co., Inc., Wilmington, Del. A 1,3-dithiolane having a carboxyl group joined, through an extranuclear saturated aliphatic hydrocarbon chain of

at least one carbon, to carbon of the dithiolane nucleus.

A process for the control of fungi comprising applying to organic matter, subject to fungus attack, a 1,3-dithiolane, hydrocarbon except for carboxyl oxygen and dithiolane ring sulfur, and having a carboxyl group joined through an extranuclear saturated aliphatic hydrocarbon chain of at least one carbon, to carbon of the dithiolane nucleus.

Industry Trade Marks

The following trade marks were published in the Official Gazette of the U.S. Patent Office in compliance with section 12 (a) of the Trademark Act of 1946. Notice of opposition under section 13 may be filed within 30 days of publication in the Gazette. (See Rules 20.1 to 20.5.) As provided by Section 31 of the act, a fee of \$25 must accompany each notice of opposition.

Diphacin, in capital letters, for rodenticide. Filed Aug. 30, 1957, by Food Machinery & Chemical Corp., New York. First use Aug. 6, 1957.

Super Dynatox, in hand-drawn letters, for insecticides and agricultural fungicides. Filed Aug. 30, 1957, by Hayes-Sammons Chemical Co., Mission, Texas. First use in May, 1957.

Kay-Bee, letters within an oval design, for fertilizer. Filed Dec. 20, 1957, by Kahn Bros. Co., Chicago. First use Sept. 12, 1940.

"Ant Buttons" for ant and insect killing insecticide. Filed Sept. 5, 1956, by Sara Harris, Miami Beach, Fla. First use Feb. 26, 1929.

Dimazine, in capital letters, for hydrazine derivatives for use in agricultural chemicals and for other uses. Filed Oct. 29, 1956 by Food Machinery & Chemical Corp., New York. First use Aug. 1, 1956.

Orcopel, in capital letters, for insect repellents in the nature of paper tissues. Filed July 5, 1957, by Orchard Paper Co., St. Louis, Mo. First use May 1, 1957.

Co-Ral, for insecticide useful for the control of external parasites of livestock, including cattle grub, by dermal application as a spray, dip, or dust. Filed Aug. 7, 1957, by Chemagro Corp., New York. First use July 31, 1957.

IMC Names Two in Purchasing Posts

CHICAGO—Two recent appointments in the purchasing department of International Minerals & Chemical Corp. include Chester F. Teeple, director of purchasing, and S. Arthur Fournier, purchasing agent in charge of central buying, effective July 1.

Mr. Teeple joined International in 1952 as assistant general purchasing agent, and Mr. Fournier joined the industrial sales staff of IMC's Potash Division in 1952.



William L. Young Russell I. Pisle

SOHIO APPOINTMENTS—Henry J. Coleman, sales manager of the Sohio Chemical Co., Lima, Ohio, has announced the appointment of William L. Young to the position of agricultural sales representative for northern Illinois, Iowa, Wisconsin and Minnesota. Sohio has been represented in this area by Russell I. Pisle, Jr., who is moving to Ohio to represent the company in the Ohio area. Mr. Young has been with Sohio for eight years, having worked in the Sohio Chemical Co.'s distribution section for the past three years. Mr. Pisle has been calling on agricultural products customers for Sohio since March of 1955 and has a total of five years experience working with agricultural customers.

Southern Control Group Change Standards

ATLANTA, GA.—The Association of Southern Feed and Fertilizer Control Officials heard talks on timely feed topics and adopted certain changes in feed standards at its 16th annual convention here recently.

Following the official welcome from Gov. Marvin Griffin of Georgia, Dr. E. W. Constable, state chemist for the North Carolina Department of Agriculture and president of the control group, addressed the convention on the subject of "The Changing Picture in Control."

Among the other talks were those by W. E. Glennon, president of the American Feed Manufacturers Assn., and a panel presentation on "Low Energy Flock Replacement Formulas," by Dr. J. R. Couch, Texas A&M College; Dr. H. W. Bruins, research division, Quaker Oats Co., Chicago; Dr. R. L. Atkinson, poultry scientist.

The new officers of the association for the coming year are Bruce Cloaninger, director, Department of Feed and Fertilizer Inspection and Analysis, Clemson, S.C., president; Harold H. Hoffman, director, Feed Laboratory, Tallahassee, Fla., vice president; and Bruce Poundstone, head of Department of Feed and Fertilizer, Lexington, Ky., secretary-treasurer.

In addition to the above officers, the outgoing president, Dr. E. W. Constable of the Department of Agriculture, Raleigh, N.C.; Maurice Rowe, Richmond, Va.; Frank Fudge, College Station, Texas; F. S. Carr, Atlanta, Ga., and Mr. DeSalvo of Arkansas, comprise the executive committee.

Next year's meeting is scheduled for June, 1959, in Little Rock, Ark.

North Central Weed Conference Scheduled

CINCINNATI—The 15th North Central Weed Control Conference has been scheduled for Dec. 3-4 at the Netherland Hilton Hotel here. Weed workers have been invited to submit papers for the conference to the sectional chairmen.

The chairmen are Dr. B. H. Grigsby, Michigan State University, East Lansing, aquatic weeds; Dr. R. R. Davis, Ohio Agricultural Experiment Station, Wooster, weed control in turf; Dr. Bruce J. Rogers, Purdue University, Lafayette, Ind., botany, plant physiology and ecology; J. J. Sexsmith, Experimental Farm, Lethbridge, Alberta, Canada, weed control (annuals, biennials, perennials); H. T. Richards, Wisconsin Department of Agriculture, Madison, regulatory and extension; Dr. S. K. Reis, Michigan State University, East Lansing, weed control in horticultural crops; Dr. Fred Slife, University of Illinois, Urbana, industrial weed and brush control.

The evening banquet will be replaced by a slide-fest, which will give workers a chance to present a pictorial story of work they have underway. Chairmen of this portion of the program are Dr. George Friesen, University of Manitoba, Winnipeg, agronomy; Dr. Fred Warren, Purdue University, horticulture, and E. P. Sylwester, Iowa State College, Ames, chemical brush control.

California Farm Store Sales Show Decrease

SAN FRANCISCO—Sales by farm and garden supply stores in California fell by more than 10% between the first quarter of 1957 and the same three months of 1958, reports the California State Board of Equalization. The new level was estimated to be \$23,706,000, including sales of farm chemicals made through these outlets. Farm implement dealers dropped their sales by almost 20% within the same respective periods, to \$32,569,000 for the Jan. 1 through March 31 period this year.

NOTHING STOPS APHIDS AND MITES ON COTTON LIKE SYSTOX®

Systemic action protects entire plant... gives long residual kill... costs less per season.

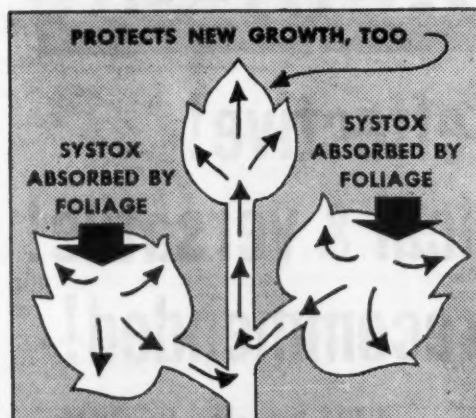
Don't take a chance on hit-or-miss results when you go after aphids and mites on your cotton this year. For a top dollar crop, use Systox, the surest, fastest, most economical aphid and mite killer on the market.

Systox is absorbed by the plant foliage. It goes to work from *inside* the plant, and keeps on working for weeks. Systox kills even the insects on the underside of the leaves, where they're often missed by ordinary chemicals.

Because SYSTOX does its work in the sap stream

of the plant, it can't be washed off by rain... it's harmless to beneficial insects after application... lasts longer... costs less per season.

Nothing stops aphids and mites on cotton like SYSTOX! Be sure you have plenty on hand for sudden infestations. Order SYSTOX from your farm supply distributor now!



HOW SYSTOX WORKS IN PLANTS

SYSTOX spray on foliage is absorbed into the sap stream where it translocates, protecting the entire plant, even new growth developing after application. Systox even kills insects on the underside of leaves where they're often missed by ordinary chemicals.

No other insecticide offers these important advantages

SYSTOX is harmless to beneficial insects after application.

SYSTOX lasts longer, requires fewer applications.

SYSTOX is absorbed into foliage of the plant, can't be washed off by rain.

SYSTOX works in the sap stream—protects entire plant—guards new growth as it forms.

SYSTOX A PRODUCT OF CHEMAGRO

"Chemicals for Agriculture—Exclusively!"

DDT TRIAL

(Continued from page 1)

infested by insect pests aerially sprayed 6.8 million acres in 1957. Some 42% of this acreage was infested by gypsy moth. Other pests aerially sprayed during 1957 were the spruce budworm, grasshopper, Mediterranean fruit fly, and beet leafhopper.

USDA points out that during the 1957 attack on gypsy moth in Pennsylvania and upstate New York, not a single formal complaint was made by a property owner.

"In combatting insect infestations," says Dr. M. R. Clarkson, deputy administrator of ARS, "we can't wait until the insect or its damages can be seen by eye. By then, it's usually too late.

"The methods used in all such pro-

grams are based on many years of research and wide experience in pest control. We welcome the decision of the court in recognizing the campaign against the gypsy moth as meeting the high standards of regard for the public welfare and rights of individuals."

A total of 124 million lb. DDT were produced in the U.S. during 1957. About half was used domestically. The rate of spraying against gypsy moth on Long Island was one lb. DDT a gallon kerosene an acre. Cost of spraying one acre aerially is about 70¢. Ground sprays against gypsy moths would cost about 25 times as much, USDA entomologists have noted.

Gypsy moths defoliate fruit, shade, forest, and ornamental trees. Infestations started by accident in 1869 in Massachusetts. The moth has heavily infested parts of New England, New York, Pennsylvania, and New Jersey. Infestations have been treated as far west as Ohio.



- proven effective!
- economical & versatile!
- widely recommended!

NO CONTAMINATION . . . USDA tests show Heptachlor-treated hay won't contaminate milk or meat!

SHORTER WAITING PERIOD . . . Just 7 days!

LONG LASTING . . . Kills grasshoppers quickly and provides residual protection 2 to 3 weeks or more!

BE PREPARED FOR BIG HEPTACHLOR SALES AND PROFITS!

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CW 6308

FARM BILL

(Continued from page 1)

the pattern for the next crop year in cotton, rice and feed grains.

For cotton the Senate bill proposes, with USDA approval, a basic area of 16 million acres. Cotton farmers, presumably from the small cotton farms of the old cotton belt, will have the choice of the present law or acreage allotments at 16 million acres, apportioned to their farms, at a price support level of 75-80% of parity for their 1959-60 crops.

It is also learned that USDA would impose not more than an 80% of parity support for cotton farmers who would comply with a 16 million acreage allotment.

This is the alternative for the big cotton farmers who do not want acreage allotments and who would prefer lower levels of support.

The Senate bill would permit those farmers to choose to increase their acreage allotments from the 16 million acre bench-mark by as much as 40%—and at the same time obtain a price support level of not more than 15 percentage points below the support level of the producers who wish to stay within the present farm act.

This would mean that cotton farmers who adopted the alternative of large acreage and lower level of supports would get for their protection in price support not more than 65% of parity for the coming crop year. In short, the big cotton farms are trading off expansion of acreage allotments for a lower level of support.

This concession is compensated for in this manner: The cotton produced on the high price support level with low acreage will be available for short term sale or disposal at 110% of the low level of price support for cotton. This would mean that such high price support level cotton would be shortly available after harvest at a market price less than the low level support price for unlimited cotton acreage.

From the viewpoint of the plant food and the pesticidal chemical industries, the Senate bill, now taking the inside post in a farm agriculture bill derby, adds up to a big opportunity for sales to the big cotton producers.

Under the terms of the Senate bill the corn economy is now facing a wide open operation. This bill would end all corn acreage allotment controls—it would put under corn a price support of not less than \$1.10 bu. for next year and apply a maximum price support level for corn of 90% of the last three average price support levels for corn in the country.

All other feed grains would be supported at not less than 60% of the parity price for those commodities adjusted to reflect their feed relationship to corn.

USDA officials tell Croplife that the Senate bill means that the minimum break-even point for corn now planned for the next crop year would reflect a price support level of 62% of parity.

At that level of support for corn, the Senate bill would order on a mandatory basis price support for sorghums and all other feed grains a level of not more than the related feed value relationship of those grains with corn, but not less than 60% of parity.

The Senate bill, briefly digested above, is likely to represent the enactment of farm legislation this year. It all adds up to a new fertilizer crop wherein the plant food industry may ascertain its sales volume and its costs at this time.

This report is seen assured as an outcome of farm legislation at this session of Congress.

Secretary Benson has given his approval of the Senate bill in terms

noted above. The Senate bill as approved by the committee last week represents the maximum concessions of the USDA.

It is probable that the Senate bill will be the ultimate in farm legislation this term of Congress.

Ending of corn acreage allotments and liberalization of cotton acreage allotment to a minimum of 16 million acres should be an important consideration factor for the plant food and pesticidal chemical industries as they go into the fall-winter months anticipating their sales expectations.

S-11

(Continued from page 1)

the provisions of the Robinson-Patman amendment to the Sherman Anti-Trust Law, the entry of a defense in the case of price competition that any such price reduction would be for the purpose of meeting competition.

The Kefauver-Patman bill as originally introduced in the House at the first session of the 85th Congress gained great popular favor in retail circles, particularly those circles which depended on the then legal fair trade laws enacted by federal statute in many states, but upset in most states since a federal court had decided that state court decisions upsetting the federal fair trade enactment were not within the jurisdiction of the Federal Supreme Court.

The Kefauver-Patman Act seemed to be running high, wide and handsome until the opposition learned of its importance. Subsequently the opposition cooled off the Senate advocates with the result that last week the latter reported out of the Senate judiciary committee a bill which would deny a legal defense based on the assertion that price concessions were made to meet competition.

This measure, which has been a thorn in the side of the fertilizer industry, must not be seen as a dead issue. It barely got out of the Senate committee and in the last hours of this session of Congress it is improbable that it can be enacted even if a favorable majority may be found in the Senate.

Sen. Estes Kefauver (D., Tenn.) is now revealed as stating he will oppose on the Senate floor modification of his bill which would deny the defense-in-good-faith for all industry.

New Colorado Firm Files Incorporation

COLORADO SPRINGS, COLO.—Articles of incorporation have been filed in the office of El Paso county clerk for Western Agricultural Chemicals Co. The purposes of the new company, according to the articles, will be to carry on in all or any of the several branches of the business of manufacturing, buying, selling and generally dealing in and with fertilizers and agricultural chemicals of all kinds.

The firm will manufacture chemicals, fertilizers, chemical compounds, agricultural chemicals, insecticides, sprays and drugs, the articles state. Capital stock was listed as 50,000 shares without par value. The main office of the company will be at Colorado Springs.

Named to the board of directors are J. B. Allison, Ray Hynes, E. S. Hampton, Harry Davis, John Gilbert and Robert T. Haver.

MOVES TO MINNESOTA

BROOKINGS, S.D.—John A. Lofgren, entomologist with the South Dakota Agricultural Extension Service for seven years, resigned effective July 1. Mr. Lofgren, a 1947 graduate from South Dakota State College, is taking a similar post with the Minnesota Extension Service.

Spray Program to Curb Sagebrush Underway in West

SALT LAKE CITY—They're "bombing" sagebrush, trademark of the Old West, out of existence.

"Operation Big Sagebrush," a bold move to curb the pesky desert-area plant, is under way with plans to spray 13,000 acres of public land in Utah, Nevada, Idaho and Wyoming. The spray halts the sage from blooming permanently, leading to its eradication and the growth of nutritious grazing grasses.

A converted U.S. Navy World War II torpedo dive bomber is being used in the spraying operations.

The new operation is the outgrowth of extensive tests in central Utah in 1954. The Intermountain Division (Region 4) of the U.S. Forest Service, conducting the current spraying operations, said the 1954 tests yielded surprising results in 1956. Lowell Farmer, regional public relations head from the region's Ogden headquarters, reported sprayed plots of sagebrush land produced 882 more pounds of grass per acre with brush growth reduced by 83%.

Experiments from 1953 through 1956 show grass yields, by weight, increased 390% in sprayed lands when deferred for a three-year term for grazing.

Preliminary test spraying of 1,350 acres of brushland at Benmore Experimental Station in Utah's Tooele County showed very good spray results, says W. A. Word, Intermountain Forest Service range conservationist in charge of the revegetation operation. Passes by the spray plane were made at altitudes of 50 to 100 ft.

Actual kill effectiveness of the spray will be determined by plant count in scores of permanent, marked one-100th acre plots next year. Grazing forage increase will be observed during the "brush-less" 1959 growing season.

Spray being used is specially prepared 2,4-D (butylester). The spray, in addition to permanently stopping blooming, causes the brush to "grow to death" by accelerating growth to the point of over-exertion. Dead, leafless stalks that remain facilitate anchoring of native and range-seeded grasses ideal for grazing.

The spray is applied at a season of the sagebrush's growth calculated to produce maximum kill. The 2,4-D is applied at the rate of three gallons per acre, two pounds of acid equivalent. The spray plane being used in the sagebrush operation is equipped with 700-gallon belly tanks.

Large areas of sagebrush lands in the Intermountain area are adaptable to the revegetation program, Forest Service officials say. Native and seeded grasses must be of sufficient coverage to warrant brush kill, however.

Areas scheduled for spraying in this year's operations are Huntington and Vernal (Ashley) in Utah; Hoback, Teton (Upper River) and Bridger-Pinedale, Wyoming; Targhee, Salmon, Leadore, Challis, Mickey, Sawtooth and Caribou, Idaho, and Humboldt, Nevada.

CALIFORNIA FIRM OPENS

PORTERVILLE, CAL.—A new garden and farm supply store opened here recently. The firm is owned by Ernest L. Heard of 120 Wisconsin St., Porterville.

Customers 100 Miles Away Rate Special Service from Nevada Dealer

By Jess Blair
Croplife Special Writer

When Reno, Nevada, is mentioned, most people think of a play town filled with pretty divorcees, roulette tables and swank night clubs. Few of them realize that Reno is also a town of churches, good stores and people who live by ordinary professions.

One of the more modern stores is Albers Feed & Seed Store, which caters to town trade as well as the narrow fertile valleys located more than 100 miles away. To serve some of these areas a system of dealer-distributors has been set up.

Mr. Albers specializes in feed and seed, but in recent years agricultural chemicals have become one of the store's best profit makers. The business is quite diversified, because in this thinly populated rural section this dealer has found it pays to handle everything a farmer or rancher needs.

The manager, Steve Tiebers, says that to get the farm trade the store

must think in terms of great distances.

"There are several isolated farming valleys a long way from here," he says, "so we have made a special effort to reach these people. We give them a complete farming program. We sell them the seed, the fertilizer, then later help with insect infestations. Some buy weed killers and livestock remedies, plus the feed, equipment and other things, such as baby chicks and farm hardware."

Mr. Tiebers says farmers in these areas are perhaps more advanced in their methods than in more populated areas. For one thing, the farming acreage is small and, in order to make a living from the soil, they aim for the highest possible yields. They fertilize the soil as recommended by the county agent or the store; they control insects, and they try to keep

abreast of the latest developments.

Since some farming areas are too far away to make regular deliveries, Mr. Tiebers has helped set up dealers in several places. Many of the villages are too small to support a complete farm store, so the products are handled by other type stores. It may be a general store, a fuel company or even a hardware store.

When the dealer is added to the Albers chain, then the home store works closely with the new merchant, helps educate him to the point where he can be of service to his customers, and may give him special training.

"In this type business, you've got to know all the answers," says Mr. Tiebers. "So many changes are taking place that the farmer depends upon the dealer to keep him informed and recommend the best products."

"We are fortunate in having well-experienced employees. Even the newest employee has been here 10 years, and many of us have been with Mr. Albers much longer than that. During those years we've gained enough experience to be of great help to our customers."

Though the farm and ranch trade is stressed, the growing town sales have not been neglected. During the last few years the store has built a large garden supply trade. In fact, it is one of the largest in Nevada, and carries numerous items not stocked by other stores.

One specialty is a complete line of saddle horse supplies, since there are several dude ranches, besides the regular commercial ranches. There are saddles, bridles, blankets, curry combs and fancy leather goods.

Another money-maker is a small nursery which was added a few

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SHOP TALK

OVER THE COUNTER

By Emmet J. Hoffman
Croplife Marketing Editor

Western dealers can take justifiable pride in the part they play in helping their farmer-customers make more profits. Western farmers get back almost \$4 for every dollar they invest in chemical weed control, according to a University of California scientist.

Boysie E. Day, assistant plant physiologist in the citrus experiment station at Berkeley, bases this estimate on information supplied by weed experts in 11 western states.

Farm chemical dealers will find in this information helpful and convincing sales ammunition which can be used in advertising and on the selling floor.

Mr. Day states that wheat growers, by using 2,4-D, save \$40,000,000 annually in production costs.

Modern herbicides save growers of green peas about \$8,000,000; sugar beets, \$6,000,000; hay, \$4,000,000; citrus and avocado fruits, \$2,000,000; potatoes, \$300,000, and dried field peas, \$150,000.

New weed killers also benefit Western railroads, which spend about \$3,000,000 annually for chemical weed control around bridges and along tracks.

Hand weeding or the replacement of weed-fouled track ballast would cost four or five times this amount, according to Mr. Day.

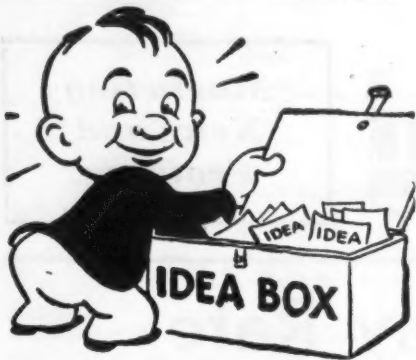
What Attracts Dealers To Company Meetings

Dealers who are interested in appraising themselves as a group may want to know what motivates them to attend dealer meetings. Usually dealers do not take much time to cogitate as to why they will or will not attend a dealer meeting but one manufacturer made an investigation to find out the reasons for lack of attendance. From the investigation it was determined that if meetings

(Turn to OVER THE COUNTER, page 13)



AT CALIFORNIA MEETING—Shown above, from left to right, at the head table at the sixth annual California Fertilizer Conference held this spring are M. E. McCollam, American Potash Institute, San Jose, chairman of the Soil Improvement Committee of the California Fertilizer Assn.; Dr. A. M. Boyce, director of the Citrus Experiment Station, Riverside, principal banquet speaker; W. G. Hewitt, Pacific Guano Co., Berkeley, CFA president; Earl R. Mog, Growers Fertilizer Co., Berkeley, conference chairman, and Dr. R. B. Bahme, western representative, National Plant Food Institute, San Francisco.



What's New...

In Products, Services, Literature

You will find it simple to obtain additional information about the new products, new services and new literature described in this department. Here's all you have to do: (1) Clip out the entire coupon and return address card in the lower outside corner of this page. (2) Circle the number of the item on which you desire more information. Fill in your name, your company's name and your address. (3) Fold the clip-out over double, with the return address portion on the outside. (4) Fasten the two edges together with a staple, cellophane tape or glue, whichever is handiest. (5) Drop in any mail box. That's all you do. We'll pay the postage. You can, of course, use your own envelope or paste the coupon on the back of a government postcard if you prefer.

No. 6762—Centrifugal Pump

The Deming Co. has begun marketing a new "light-weight," self-priming portable centrifugal pump powered by a Briggs & Stratton engine. The pump is said to meet the requirements of handling liquid fertilizer. Called the "Fig. 3,307," the pump has a stainless steel alloy pump shaft coupled to the engine shaft by a compression coupling which "assures perfect alignment." None of the liquid being pumped touches the engine shaft, it is claimed. Check No. 6762 on the coupon and mail it to secure details.

No. 7057—Dolly Bag Closer

An adjustable, portable, manually-operated dolly bag closer for closing small size bags has been announced by the Minneapolis Sewing Machine Co. The model—JD-4—closes paper, cotton or burlap bags of any size up to 25 lb. Check No. 7057 on the coupon and mail it to secure details. Please print or type name and address.

No. 6761—Concentrates

The Diamond Alkali Co. announces the availability of low volatile 6-lb.

Ethyl Hexyl Esters of 2,4-D and 2,4,5-T to custom applicators of herbicides. These high acid equivalent concentrates are said to make possible substantial cost economies and provide a number of other important advantages in weed and brush killing operations. The concentrates may be mixed with water for an emulsion, with straight oil for an oil spray, or with a combination of oil and water. To secure further details please check No. 6761 on the coupon and mail it to Croplife.

No. 6760—"Sevin" Folder

A folder explaining how to use "Crag Sevin," a new insecticide for apples and pears, is available from Union Carbide Chemicals Co., Division of Union Carbide Corp. "Sevin" may now be purchased in limited quantities by experienced apple and pear growers for field testing. Secure the folder by checking No. 6760 on the coupon and mailing it to Croplife.

No. 6763—Granular Fertilizer Chain Mill

Literature describing the granular fertilizer chain mill manufactured by the Fertilizer Engineering & Equipment Co., Inc., is available. The mill is said to be a unit that cracks in-

stead of pulverizes. Officials say that the "normally over 75% of throughput will be in the selected range of sizing." The mill is of the non-clogging design. Check No. 6763 on the coupon and mail it to secure details.

Also Available

The following items have appeared in the What's New section of recent issues of Croplife. They are reprinted to help keep retail dealers on the regional circulation plan informed of new industry products, literature and services.

No. 7063—Vibrator

A new type vibrator to break bridging of materials in storage bins, supply ducts and containers has been developed by the Thayer Scale Corp. Vibration is not applied directly to the side walls of the hopper or duct, but rather to screens which are inserted within the chamber. Various sizes and shapes of vibrators are available. Check No. 7063 on the coupon and mail it to secure details.

No. 6756—'Amino Triazole' Weed Killer

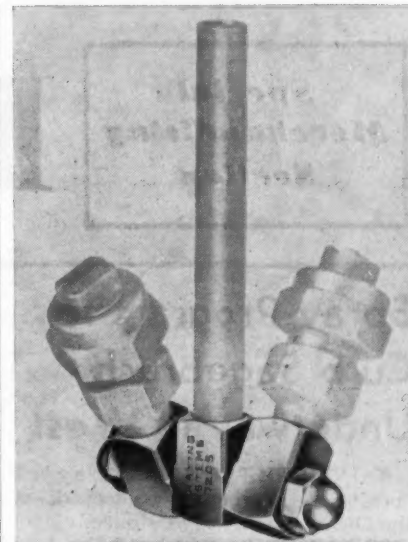
A folder entitled, "For Clean Corn Land—Amino Triazole Weed Killer," has been prepared by the American Cyanamid Co. The product, explains the folder, kills Canada thistle, sow thistle, poison ivy, poison oak, honeysuckle, milkweed, leafy spurge and other weeds. Check No. 6756 on the coupon and mail it to secure details.

No. 6757—Truck Applicator

The Broyhill Co. has announced details of its truck applicator for complete analysis fertilizer solutions. Company officials state that the unit has been field tested during the past two years. The unit, claims the company, can: Transport one to three types of solution in the 3-compartment, 1,000 gallon steel tank; be easily and quickly removed from the truck; apply up to 200 acres a day; spray a uniform 30-ft. swath; transfer solution from truck tank to other field applicators; and transfer solution from storage tank to truck tank at the rate of 100 GPM. Secure details by checking No. 6757 on the coupon and mailing it to Croplife. Please print or type name and address.

No. 6751—Swivel Connectors

For setting spray nozzles to any desired angle in row crop spraying, the Spraying Systems Co. has introduced a new line of lightweight, double and single swivel connectors for mounting to drop pipe ends. Connector bodies are adjusted to any point in a 360° range and are held in position by lock nuts. They are supplied



in two sizes as No. 7205 for use with 1/4 in. drop pipes and 1/4 in. inlet connection Tee Jet spray nozzles—and No. 7450 for use with 1/4 in. drop pipes and 1/4 in. inlet connection Tee Jet spray nozzles. For complete information check No. 6751 on the coupon and mail it to Croplife.

No. 6754—Rubber-Lined Drums

Specifications for the "series 800" and "series 801" rubber-lined drums of the Industrial Division, Gates Rubber Co., have been outlined in a new leaflet. Dimensions of the drums and other facts are given. Check No. 6754 on the coupon and mail it to secure the leaflet. Please print or type name and address.

No. 6752—Bindweed Killer

Bindweed, Canada thistle, trumpet vine and other broadleaved perennials can be eliminated for a year or longer by one spraying with a new chemical weed killer, "Tryben 200," states the Du Pont Co. The material is based on the dimethylamine salt of trichlorobenzoic acid (TBA) and contains 2 lb. acid equivalent per gallon. It is said to be effective through both contact and residual action. The chemical is non-selective and is formulated as a liquid to be diluted with water for spray application. Check No. 6752 on the coupon and mail it to Croplife to secure details.

No. 6749—Quackgrass Control

The use of "MH-40," trade name of a product for the control of quackgrass, wild onions and to retard grass growth, is described in new literature prepared by Naugatuck Chemical, Division of the United States Rubber Co. The quackgrass control folder includes instructions for use of "MH-40," a table for mixture, advantages, use in the garden and other information. Another folder explains the use of the product to retard grass growth along highways, cemeteries, golf-course roughs, airfields and unused areas. Check No. 6749 on the coupon and mail it to Croplife to secure the literature.

No. 6755—Weed Control Product

A new brochure describing "Penco Penite-6X," a product used for control of weeds, trees, stumps, potato tops, aquatic weeds and termites, has been released by Pennsalt of Washington Division, Pennsalt Chemicals Corp. The brochure includes a description of the product, its composition and directions for using it for various controls. Secure the brochure by checking No. 6755 on the coupon and mailing it to Croplife.

No. 6759—Soil Treatment Movie

A new sound-and-color 16 mm. film which portrays how soil fumigation increases crop yields has been produced by the Stauffer Chemical

Send me information on the items marked:

- | | |
|--|---|
| <input type="checkbox"/> No. 6749—Quackgrass Control | <input type="checkbox"/> No. 6758—Residue Booklet |
| <input type="checkbox"/> No. 6750—Drum Literature | <input type="checkbox"/> No. 6759—Movie |
| <input type="checkbox"/> No. 6751—Swivel Connectors | <input type="checkbox"/> No. 6760—Folder |
| <input type="checkbox"/> No. 6752—Bindweed Killer | <input type="checkbox"/> No. 6761—Concentrate |
| <input type="checkbox"/> No. 6753—Preblender | <input type="checkbox"/> No. 6762—Pump |
| <input type="checkbox"/> No. 6754—Drums | <input type="checkbox"/> No. 6763—Granular Mill |
| <input type="checkbox"/> No. 6755—Brochure | <input type="checkbox"/> No. 7038—Bag Release |
| <input type="checkbox"/> No. 6756—Weed Killer | <input type="checkbox"/> No. 7057—Bag Closer |
| <input type="checkbox"/> No. 6757—Applicator | <input type="checkbox"/> No. 7063—Vibrator |

(PLEASE PRINT OR TYPE)

NAME

COMPANY

ADDRESS

CLIP OUT—FOLD OVER ON THIS LINE—FASTEN (STAPLE, TAPE, GLUE)—MAIL

FIRST CLASS
PERMIT No. 2
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P. L. & R.)
MINNEAPOLIS,
MINN.

BUSINESS REPLY ENVELOPE

No postage stamp necessary if mailed in the United States

POSTAGE WILL BE PAID BY—

Croplife

P. O. Box 67

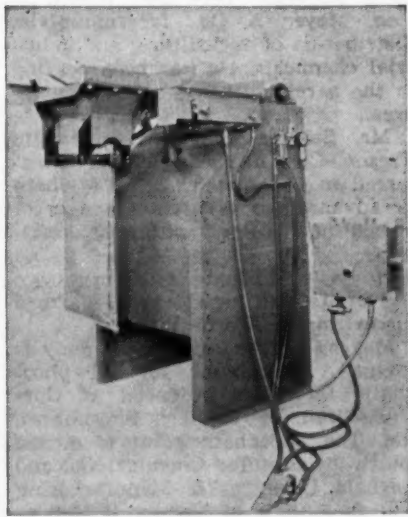
Reader Service Dept.

Minneapolis 1, Minn.

Co. Prints are available on loan, and without charge, to interested agricultural groups. The 12-min. film depicts, in actual field scenes, modern methods of applying liquid soil fumigants such as "Vapam." It also includes a series of problem-and-solution sequences which show how soil fumigation has been used to control pinkroot (onions), fusarium wilt (gladioli), oakroot fungus (fruit trees), nematodes (vegetable acreage) and weeds and soil pests in seed beds. One section of the movie portrays how trees planted in fumigated soil grow measurably faster than those set out in untreated soil. Details about securing the film may be obtained by checking No. 6759 on the coupon and mailing it to Croplife.

No. 7038—Automatic Bag Release

A new automatic bag release converts "G-73 Impackers" (or any bagging scale with a universal air-operated bag holder) to automatic operation, it has been announced by the Richardson Scale Co. The unit is designed for textile and paper wall bags and can be supplied as an optional feature on new equipment or adapted



to "Impackers" and scales already in use. For more information check No. 7038 on the coupon and mail it to this publication.

No. 6758—Pesticide Residue Booklet

Hazleton Laboratories has produced a booklet entitled, "Growers' Service Pesticide Residue Analysis" which discusses residue problems. Instructions and suggestions for using the firm's services are explained. Secure a copy of the booklet by checking No. 6758 on the coupon and mailing it to Croplife.

No. 6753—Preblender

Drawings and literature describing the "preblender-ammoniator-granulator" (patent pending) manufactured by Fertilizer Engineering & Equipment Co., Inc., are available. The company announces that "this new approach to pre-mixing of all materials before ammoniation yields quality product and reduces formation of chloride fumes." Secure further information by checking No. 6753 on the coupon and mailing it to Croplife.

No. 6750—Drum Literature

Vulcan Containers Inc. has prepared two pamphlets describing specifications of drums recently added to its expanded product line. One of the pamphlets reviews the advantages of the 55-gal. tight head "Uni-Drums" which interlock because of slightly offset rolling hoops. The other pamphlet explains the uses and describes the accessories for open and tight head 55-gal. drums, the single and double blade 55-gal. agitator drums, the open and closed head 15-gal. drums, and 100- and 120-lb. capacity open head grease drums. Check No. 6750 on the coupon and mail it to secure details.

NEVADA DEALER

(Continued from page 9)

years ago. Along with a brisk sale of nursery stock, there has been a corresponding increase in small packaged fertilizer, insecticides, weed killers, and other agricultural chemicals.

"We find the nursery brings in almost double the amount spent for nursery stock," Mr. Tiebers says. "When shrubs, trees and flowers are sold, the customer usually buys many other things needed to make his gardening or home beautification program more successful."

The product with the widest market range is the certified seed the store sells. The store not only buys and sells seed, but it does a good business in cleaning seed for other dealers in Nevada and just across the line in California.

Because the seed business covers a vast territory, Mr. Albers saw the need for effective advertising. His advertising now covers several mediums, including agricultural magazines, newspapers, radio, TV and direct mailing.

Advertising is even more important in a town of this size than in a small town, according to Mr. Tiebers. The town is a busy, crowded place with very few wide boulevards or shopping centers, so the residents sometimes have difficulty finding any certain store.

The Albers Feed & Seed Store finds television the most effective advertising for the town trade, and they keep the store's name on the TV screens of Reno every day. Mr. Tiebers said that a majority of their new customers find their way to the store after seeing the firm's name and location on a TV program.

Aside from the steady growth of the firm, there are two problems that vex the farm store owner in this area. One is the fast-growing suburbs of Reno, which continually finger out from town into the rich valley, absorbing farm homes and cropland, and reducing the number of rural customers.

The store tries to offset this by adding customers farther away from Reno, and by increasing the number of town customers.

The other problem, which seems to be common with all store owners, is the credit buying. For many years farm people have bought on credit and are reluctant to change their ways.

"Most farmers have a good credit rating with us," says Mr. Tiebers, "but so many things can happen and so many farmers end the season in the red that we have tightened our credit reins."

"In town we find the same thing but for a different reason. This is an age when people move about more than ever. Many are getting in the habit of not paying their bills. They come into a town, stay awhile, then leave town without paying their obligations."

The Albers Feed & Seed Store doesn't lose much on credit. They know their farm customers well, while those in town must have a credit rating before buying goods on time. Even then the amount is kept low and payment must be made within 30 days.

CALIFORNIA BULLETINS

BERKELEY, CAL.—Three new pamphlets have been issued by the Division of Agricultural Sciences of the University of California. They are Leaflet 85: 1958 Spray Program for Alfalfa Hay; Leaflet 86: 1958 Spray Program for Alfalfa Seed; and Circular 468: Castor Beans in California, prepared by Leroy H. Zimmerman, Milton D. Miller and Paul F. Knowles.

What's Been Happening?

This column, a review of news reported in Croplife in recent weeks, is designed to keep retail dealers on the regional circulation plan up to date on industry happenings.

Federal, state and local agencies were fighting a major grasshopper outbreak in the Southwest states. In some areas it was described as the worst plague since the 1930's. . . . On the eve of the annual meeting of the National Plant Food Institute, industry leaders told Croplife that they generally were optimistic about overcoming the slow fertilizer start caused by cold, wet weather this spring.

At the convention speakers explored ways and means to alter farmers' attitudes and practices regarding use of plant foods. It was generally concluded that soil tests, farm demonstrations, alert retailers, a broad program of education and adequate credit are the principal factors to bend the fertilizer use curve upwards.

Plant nutrient supplies for 1957-58 fiscal year are adequate, but still down 2% from the past fiscal year, the U.S. Department of Agriculture reported in its annual "Fertilizer Situation" compilation distributed early in June. An estimated 6,506,000 tons of nitrogen, phosphate and potash are available for domestic fertilizer purposes in the fiscal year ending June 30, 1958, the report said.

The National Cotton Council forecast a critical situation for the cotton industry unless changes are made in existing federal farm legislation during the current session of Congress. A spokesman said that rules must be changed to allow production of adequate supplies of cotton at competitive prices to compete in world markets.

Federal Land Banks reported an unusual level of farm loans to enable farmers to purchase new equipment. This fact is regarded as being a good omen for the fertilizer and pesticide industries, since the investment in more efficient machines must be matched by greater productivity from the soil.

A bill to remove the 3% federal tax on rail freight was not given a very long chance of success in the Senate early in June. The bill, introduced by Sen. George Smathers (D. Fla.) had formidable opposition in the administration's reluctance to grant any reduction in taxes in 1958.

Maurice H. Lockwood resigned his position of vice president of International Minerals & Chemical Corp., in charge of the Plant Food Div. John D. Zigler became general manager of the division.

The Senate Interstate Commerce Committee approved and sent to the Senate a floor bill which would have a marked effect on the use of private carriers engaged in hauling agricultural commodities in return haul loads in interstate commerce. The amendment will be fought by the association of private carriers, but has the support of railroads and trucking associations.

The National Cotton Council advocated a program for cotton that would give individual farmers a choice between higher acreage and a lower price or lower acreage and a higher price. The program would compensate for the "large margin of error which is inherent in forecasting production, consumption and exports a year or more ahead," the Council said.

Work at the USDA agricultural research center at Beltsville, Md., may uncover information about regulating the kind and amount of fertilizer to use for maximum effect on insects and mites as well as for a maximum crop. Early studies show possibilities in this direction.

Cooperative Farm Chemicals Assn. announced plans for major additions to its nitrogen plant at Lawrence, Kansas. Cost of the expansion was estimated at \$5 million.

Production of superphosphate and other phosphatic fertilizers from July to March, was up 5% over the same period of the previous year. The Bureau of the Census reported that tonnage for this nine-month period was 1,820,223 tons against a tally of 1,740,440 tons the previous year.

Congress was preparing legislation to provide funds for research on the effects of pesticides on wildlife. Government officials hailed the move as being one of the most constructive to come about in years, in bridging the gap between the USDA and the Department of Interior caused by misunderstanding in seeking ways to gain common ends.

Two new pesticide plants were completed in May. One, operated by Arizona Fertilizers, Inc., Phoenix, is located at Willcox, Ariz.; the other, by General Chemical Division, Allied Chemical Corp., is in Minneapolis.

Fertilizer prices are up about 1% at the retail level this year, according to the U.S. Department of Agriculture. The 1% represented that much of a gain over the retail prices of last year.

Mid-South fertilizer sales were running below those of the previous year mostly because of foul weather which plagued agriculture earlier in the season. Some manufacturers and distributors reported that sales were as much as 30% behind last year, but deliveries were picking up well.

A report by the U.S. Department of Agriculture indicated that grains stored on farms in a number of midwestern states totaled 2.5 billion bu., and that further expansion of farm storage facilities will be needed. This situation was seen by Croplife's Washington correspondent, John Cipperly, as presenting an opportunity to the pesticide industry for sales of protective products for the stored materials.

Dr. William P. Boyer was named head of the chemical division of Virginia-Carolina Chemical Corp., Richmond.

An infestation of desert locust, or band-winged grasshoppers, in Arizona was brought under control after a ten-day cooperative federal-state spraying effort over some 140,000 acres of desert land adjacent to irrigated crop lands. Several thousand acres of cotton and vegetable crops were damaged by the insects, but the control measures are credited with saving the major portion of crops.



Doing Business With

Oscar & Pat



By AL P. NELSON
Croplife Special Writer

It was one of those ideal merchandising days that every retailer experiences now and then—when customers just flock to the store, all at the same time, and each ready to buy. Late spring and the beginning of spraying season had something to do with it, of course.

Many gardeners milled around the big showroom of the Schoenfeld and McGillicuddy store anxious for service. Garden spray materials, sprayers, weed killers, were in big demand. And to make matters worse, about five organic customers stood reading labels on products they planned to buy. They were very careful buyers. They insisted on knowing the name of every ingredient, the amounts in the products and they asked endless questions.

"Where's that Pat?" growled Oscar to Tillie as he hurried around waiting on customers. "He has been gone two hours. I'll bet he's sitting in the coffee shop."

Red Corcoran, one of the warehouse men whom Oscar had called in to help wait on customers, grinned. "Ed Bailey said he saw Pat and Banker Smith drive east about an hour ago. They passed Ed as he was coming back for another load of anhy to sidedress corn on Mike Moran's place."

"Oscar," said Ken Peters, a tall, tanned farmer in overalls, "I'll clerk for yuh for an hour. My missus is down to the department store. I won't see her till noon. I'm worth \$4 an hour, but seein' it's you I'll only charge \$3."

"We can't afford to hire anybody else," Oscar snapped. "Times are too tough and costs are too high. We're lucky to get enough to eat."

"Yeah," said Ken Peters, his eyes twinkling. "I feel sorry for you fellows. Well, my cows are still giving milk, and I got some broilers ready to kill. Gee, if you fellows get too hungry come on out to my farm and I'll set all of you up for a free meal. Won't even ask you to help milk the cows or haul out manure, either."

"Mister," a small, freckle faced boy of 12 said, holding up a hand sprayer to Oscar, "my Ma bought this here five days ago, and it won't work."

Ma and Pa had a fight over him spraying the raspberry patch and now when he goes to do it the sprayer won't work. He wants his money back, or a new sprayer."

Oscar flushed. "Ach, he bought it and it was okay then," he cried. "He must have bunged it up somehow. We can't do nuthin' about it."

"I want some very high vitamin content dog food for my dog Mimi," said a tall, tight lipped spinster with pince nez glasses. "She has been sort of listless lately and I'm worried about her. I think she has the spring fever, no, it's summer now. It must be summer fever, then. What do you recommend?"

Oscar was just going to reply "Shoot her," but found himself saying: "There's the X brand dog food. The label's a mile long. Read it yourself."

A pudgy, snuff chewing farmer ambled up to the counter. "That darn shipment of bull semen didn't come by parcel post this morning. I got three cows I gotta get bred. Know anybody that's got a big, strong bull, Oscar? You know what's goin' on on farms."

"Bulls!" barked Oscar. "I don't like bulls. We sell fertilizer. Ach, I would like to know something, too. Where is that dumbkopf partner of mine? He should be here helping me. Ach, if you see him, let him look for a bull for you."

"Hey, what's the matter with you—drink too much sauerkraut juice this morning?" growled the pudgy farmer. "Remember I buy fertilizer here and a lot of it. And I pay my bills. You're just like my old lady. She wakes up grouchy some mornings and starts pesterin' me. I let her go just so long, then I light into her and she shuts up. Maybe I got to do the same to you."

Then, as quickly as the surge of customers had come into the store, the traffic flow slowed. In fact, it was so slow that Oscar and Tillie could almost hear each other breathe as they sat at their desks trying to get their thoughts adjusted to office work after the fast stepping sales work.

Suddenly someone could be heard whistling an Irish tune, and in stepped Pat, clad in grey slacks, tan sport shirt and blue eyes twinkling.

"Beggorra, it's nice and cool and

quiet here," he said cheerily. "You folks have it easy. You don't have to get out in the heat like I do."

What followed had best not be recorded. There are eavesdroppers who reported to the village gossips that in the Schoenfeld & McGillicuddy store that afternoon, bulletins on the walls curled, correspondence on desks got scorched at the edges, a wandering dog that happened to get into the store ran howling out into the street. Gossip also said that radio sets in the village heard a strange gibberish of German and Irish and strange cuss words and shouts.

Be that as it may, when Tillie Mason got back from the coffee shop to which she had fled, she found two exhausted men, Oscar and Pat, sitting whitefaced and sweating at their desks, their voices strangely hoarse.

"Oscar," Pat said slowly, as Tillie came in the door. "The NPFI survey on fertilizer financing said farmers never took the initial step in asking bankers to finance fertilizer purchases. That gave me the idea. All I did was contact the bankers in the county, show them my full page ad copy saying they would be glad to have qualified farmers stop in and discuss fall fertilizer loans with them, that they would be willing to do some fall fertilizer financing. How did I know you people were busy around here and short handed?"

"Ach, I feel weak," Oscar said suddenly. He staggered to his feet, and reached for his yellowed, seven-year straw hat. "My liver hurts. I go home and rest an hour maybe. McGillicuddy, give me \$8,000 down tomorrow and you can buy the damn business. Bulls, dogs with summer fever, sprayers that don't work, organics reading labels—Himmel!"

Monsanto Plans New Road To Phosphate Mine

SODA SPRINGS, IDAHO—Monsanto Chemical Co. has announced that it will build a new private road between its elemental phosphorus plant here and its phosphate mine 11.2 miles away.

The new road to be constructed by Morrison-Knudsen Co., which operates the mine for Monsanto, will enable use of specially constructed carrier units capable of hauling 75 tons of ore each trip. This is three times the haul load possible with present transportation operations, a Monsanto official said.

Vacation Break

KENNEWICK, WASH.—The Phillips Pacific Chemical Co. anhydrous ammonia plant at nearby Finley is ceasing operations while employees are on vacation.

W. D. Feyton, plant manager said a standby staff at the new \$15,000,000 plant will load products during the vacation period. The plant, completed last year, supplies anhydrous ammonia products to the Columbia Basin irrigation project located north of the plant in central Washington.

NEW SUPERINTENDENT

PULLMAN, WASH.—Dr. Perry C. Crandall has been named to succeed Dr. Richard M. Bullock as superintendent of the Washington State College experiment station at Vancouver. Dr. Bullock is resigning to work for Oregon State College. Dr. Crandall, associate horticulturist at the main experiment station here, was with Iowa State College before joining Washington State College in 1951.



Philip A. Sawyer

Philip A. Sawyer in New Post with Meyer

SALT LAKE CITY—Philip A. Sawyer has been named assistant sales manager here for Wilson & Geo. Meyer & Co., Intermountain, distributors of agricultural and industrial chemicals. He has been serving in the parent company's Los Angeles area.

Mr. Sawyer joined the firm in Fresno, Cal., in 1955. He was transferred to Los Angeles in 1956 where he advanced to assistant manager of agricultural sales, southwest territory.

He is a graduate of Georgetown University and served in the armed forces during World War II.

Meyer's Intermountain company is exclusive distributor for all phosphatic fertilizers produced at Garfield, Utah, by Western Phosphates, Inc. The phosphate plant is owned jointly by Stauffer Chemical Co. and Garfield Chemical & Manufacturing Co., an affiliate of Kennecott Copper Corp. and American Smelting & Refining Co.

William I. Zeigler Joins California Firm

BERKELEY, CAL.—William I. Zeigler of Portland, Ore., has joined the staff of the California Farm Supply Co. as manager of chemical sales. Mr. Zeigler, an agricultural science major, holds a B.S. degree from Alabama Polytechnic. He was employed by American Cyanamid Co. of New York for 12 years, as both sales supervisor and manager in agricultural chemicals.

Wyoming Tonnage

CHEYENNE, WYO.—Wyoming fertilizer shipments in 1957 totaled 10,236 tons, compared with 10,619 tons in 1956, the Wyoming Department of Agriculture has reported. The 1957 sales included 2,892 tons of mixed goods, 4,317 tons of nitrogen materials and 2,990 tons of phosphate materials.

FOREST FERTILIZATION

PULLMAN, WASH.—A \$4,000 grant has been made by California Spray-Chemical Corp. to Washington State College to determine if fertilization can increase the production of timber as much as it has increased fruit and crop yields. In announcing the grant, Dr. B. R. Bertramson, WSC agronomy and soils chairman, said samples taken from forest sites where fertility experiments are under way and where response data is being collected indicate the possibility of timber fertilization. Soil samples collected by the Crown Zellerbach Corp. and the Weyerhaeuser Timber Co. may be among the first to be analyzed. Field fertilization experiments are also being conducted by the forestry schools at Washington State College and the University of Washington.



AGRONOMY AWARD—Larry L. Casey, center, agriculture student at the University of Illinois has been selected 1958 winner of the National Plant Food Institute's "Best Agronomy Junior Award" including a cash prize of \$200. Larry, whose father's 200-acre hog and dairy farm is near Bingham, Ill., has had a scholastic average of 4.2 where 5.0 is a straight A. The award was presented recently by Dr. W. A. Burger, left, of the agronomy department at Illinois, and Zenas H. Beers, Midwest regional director of the Institute.

Range Fertilization Shows Continued Profit Year after Year, Tests Show

SAN MARINO, CAL.—Range fertilization demonstrations at California State Polytechnic College, San Luis Obispo, show continued profits year after year, according to the California Fertilizer Assn. A detailed report on progress of the Cal-Poly demonstrations was given to the sixth annual California Fertilizer Conference, held recently on the campus at San Luis Obispo, by Dr. Logan Carter, head of the soil science department.

Dr. Carter said that profits are shown during each succeeding year, "with considerable residual benefits regardless of total annual precipitation." He also reported that "commercial fertilizers on range lands having conditions comparable to those of the San Luis Obispo area can be expected to give the land operator a satisfactory profit year after year."

"The production of green feed early

in the rainy season when range feed is critically short will tend to improve the stability of range livestock operations. With more animals per acre possible on fertilized ranges, relatively small operators have more flexibility in their manipulation of livestock operations. Animals from fertilized range may be moved directly to slaughter or be moved to feed lots in a condition for maximum finishing operations.

"Improvements in range land conditions can be expected from range fertilization in that better use is made of all vegetation, less desirable plants are discouraged by a higher intensity of stocking and the operation will be encouraged to initiate better over-all management practices."

Dr. Carter presented the following table to illustrate the benefits and profits which accrued during a three year period, following a single application of fertilizer in the fall of 1952.

Date—Green Feed Period	1952-53	1953-54	1954-55	3-yr. avg.
Rainfall—Total Inches	16.12	19.74	17.27	
Acres—Total In Field	49.0	49.0	49.0	
Acres—Fertilizer-300 lb. 16-20 Fall 1952 ..	40.0			
Animals—Kind & No. in Demonstrations ..	Heifers 41	Steers 26	Steers 27	
Dates Into and Out of Field	1-15-53 to 5-8-53	2-14-54 to 6-7-54	1-4-55 to 6-1-55	
Days Grazing	113	115	147	125
Days Per Acre	81	61	81	74
Fertilized Acres Per Animal	0.98	1.54	1.48	1.33
Average Weight Into Field	510	617	577	568
Average Weight Out of Field	668	780	770	742
Average Gain in Pounds	158	163	200	174
Daily Gain in Pounds	1.39	1.41	1.36	1.39
Beef Produced—Each Fertilized Acre	147	88	116	117
Beef Produced—Each Unfertilized Acre ..	58	80	80	73
Net Gain From Fertilization	89	8	36	44
Beef Price Per Pound	24c	22c	20c	
Beef Value Per Acre	\$21.36	\$1.76	\$7.20	\$5.33
Fertilizer Cost Per Acre	\$16.00			
Net Profit Per Acre	\$5.36	\$1.76	\$7.20	\$4.77

OVER THE COUNTER

(Continued from page 9)

were streamlined, attendance of dealers could be boosted to 85% of all those handling a certain line.

The secret of a dealer meeting, it was felt, was to conduct it sincerely, spruce it up and sell it well and thoroughly.

The company analyzed the situation and five years ago started planning each spring series of annual dealer award banquets based on the following nine points:

"1. Make certain everyone is invited, not once, but several times. Convey the thought that the company really wants them there.

"2. Include the dealer's wife. She will add friendliness to the gathering. Besides, she often shares fringe responsibility for her husband's success; and she delights in an evening away from the kitchen.

"3. Arrange for the best dinners available.

"4. Invite a guest speaker.

"5. Honor the top dealers in some way, for example, by presenting each with a plaque.

"6. Schedule the meetings in a way to minimize travel requirements.

"7. Remember that little things count big—corsages, place mats, comfortable surroundings, no off-color jokes.

"8. Stick to a 10 p.m. curfew.

"9. Use humorous skits for 'soft-selling' promotion plans. Avoid over-commercialization."

This spring, it was noted, the seventh banquet of the series was conducted, and 92 top dealers were honored. More than 85% of the invited guests were in attendance.

California Plans New Quarantine Stations

SACRAMENTO — The California Department of Agriculture plans construction of two new border plant quarantine stations, one at Truckee and the other at Twenty Nine Palms.

The Truckee building will be the first of several new type stations to be located on freeways leading into California. Its design will include many features to facilitate rapid clearance of heavy traffic undergoing plant inspection of baggage and belongings.

A heavy increase in travel over the Amboy-Twenty Nine Palms highway prompted the new station at the latter community.

The purpose of California's 18 permanent plant quarantine inspection stations, maintained by the California Department of Agriculture for more than a quarter of a century, is to protect the state's two billion dollar agricultural industry from losses through the introduction of insect pests, plant diseases, weeds, or animals not presently found in the state.

HONOR PLANNED

PORTLAND, ORE.—A certificate of merit for outstanding work on the Soil Improvement Committee of the Pacific Northwest Plant Food Assn. will be presented to Norman Hibbert at the ninth annual fertilizer conference at Pocatello, Idaho, July 8-10. Mr. Hibbert, who resigned from the committee last winter after service the entire eight years the committee has been in existence, attended every meeting of the committee. He is also currently serving on the board of directors of the plant food association. He represents the Anaconda Co. in Oregon, Washington and Idaho, making his headquarters in Yakima, Wash.

Conservation Slide Rule Computes Soil Losses

WASHINGTON—Research data on soil conservation, gathered by U.S. Department of Agriculture scientists over the past 30 years, is now available for practical use by technicians in the form of a simple "conservation slide rule" which makes possible fast and reliable soil-loss estimates right in the field.

This slide rule, developed from information compiled by scientists of USDA's Agricultural Research Service, is in use by soil-conservation technicians in the nine Corn Belt states to help farmers protect their land. It was designed by Dr. J. J. Pierre of the Soil Conservation Service, using information previously available to soil conservation technicians only in tabular and chart form.

Although the present slide rule is adapted only to Kentucky, Minnesota, Iowa, Missouri, Wisconsin, Illinois, Indiana, Ohio and Michigan, research information is being developed to make similar prediction methods available to soil conservation technicians in other parts of the United States.

Since 1929, soil and water conservation experiment stations throughout the country have been studying the most important factors governing the amount of soil and water lost from farmland during rainstorms. All these factors except rainfall itself are influenced to some extent by the method of cropping and conservation practices used.

The rate of erosion caused by storms depends on the force with which raindrops stir up soil and the amount and speed of the runoff water. Erosion is also affected by the kind of soil, kind and amount of soil cover, and steepness and length of slope, as well as soil-management and conservation practices.

When enough experimental data are available to give accurate relative values for these various factors, mathematical methods can be used to estimate or predict soil loss on a particular farm. Such data are now available for some areas of the country in the humid region. Soil-loss prediction methods based on these data have been developed and used in both the Corn Belt and the Northeast.

The conservation slide rule developed for the Corn Belt states has been checked by many scientists and field workers and found to be a valuable and effective tool for field work, USDA says.

CEREAL FIELD DAY

PULLMAN, WASH.—A walking tour of the Washington State College cereal research plots will highlight the college's annual Cereal Field Day, July 2. The half-day afternoon event will be held on the college's new agronomy farm near Pullman.

2,4-D Found Effective In Clearing Pasture Land of Oak Trees

SACRAMENTO—The chemical 2,4-D has been found to be an effective means of clearing Sierra Nevada foothill pasture land of oak trees at minimum cost.

The oaks are treated by making a series of slash ax cuts around the base of the tree trunk, spaced not more than one and one-half inches apart, and painting the wounds with 2,4-D. Complete death of the tree is accomplished in about one year. It gradually disintegrates and in several years falls to the ground where it can be burned. Decomposition of the wood is so complete that it is useless for commercial firewood.

The cost of the process is about \$5 per acre for 2,4-D. A. L. Snell of Brown's Valley who has used the process with excellent results believes that in handling blocks of pasture, firebreaks could be run and dead trees burned for complete clearance at less than \$10 per acre. This compares with \$22 per acre for felling, piling and burning scrub oak.

One of the unexpected dividends of the process has been a remarkable additional increase in forage production in the areas formerly shaded by the trees. Tests by University of California specialists and farm advisers have shown that forage under dead trees shot up to five times previous growth, or substantially more than production in open areas between trees. Bulldozing or felling trees by hand does not give the same sudden, mysterious growth to the grasses beneath.

"We do not know what is making grass and clover under trees killed with 2,4-D grow more, but you can see and measure the difference," said Lester J. Berry, agricultural extension service range specialist. "Of course, we also do not know how long the extra growth will last, but it has held up for three years so far."

Test plots in several counties, including Placer, Tehama, Glenn and Butte, will be watched during coming years to determine what factors are responsible for the extra growth.

CLOVER PEST

GRANGEVILLE, IDAHO — Clover seed growers in this central Idaho area are fighting a clover bud caterpillar infestation in crops of Alsike and White Dutch clover. Growers report it is the first evidence of the infestation in more than ten years.

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FARM SERVICE DATA

Extension Station Reports

Alfalfa growers who over-irrigate may invite trouble from two major diseases. University of California research has shown that excessive flood irrigation increases damage from *Phytophthora* root rot of alfalfa occurring in the winter and "scald" or summer flooding injury, according to Donald C. Erwin, assistant plant pathologist at Riverside.

Numerous field observations indicate that excessive soil moisture also increases the severity of *Rhizoctonia* root canker, another serious summer disease.

These diseases cause big losses each year in the Imperial and Palo Verde valleys, two of California's main alfalfa areas. Entire stands are often lost and must be replanted each fall.

Summer flooding injury, known as "scald" because of the belief that high water temperature alone causes the injury, results to a large extent from lack of air in the flooded soil, Mr. Erwin found. Higher temperatures probably act to hasten injury by increasing the activity of roots, fungi and bacteria and their demand for soil air.

Mowing just before flooding increases susceptibility of alfalfa to flooding injury, his studies showed. Therefore a 7-to-10-day wait between mowing and irrigation is advisable.

★

Fresh cherries which have been fumigated properly may now be shipped into California and Idaho from Oregon. Establishment of a federal tolerance for ethylene dibromide as a cherry fruit fly fumigant has resulted in removal of prohibition of shipment into those states. Before this, the two states refused to accept fresh cherries from Oregon because of the pest and the unknown residual from the fumigation.

★

More "take-home" profits for farmers can come through a planned investment in soil improvement that cuts the cost of producing crops, ac-

cording to a statement by the Middle West Soil Improvement Committee.

Costs go down when yields per acre go up through increased soil fertility, the statement points out.

Every extra bushel per acre helps the farmer reduce his overhead. He gets a bigger return for each hour of plowing, each round with his combine or picker, each dollar he devotes to crop production.

Farmers can put their soil in shape for these lower costs and higher yields with well-fertilized rotations, the committee's statement says. Organic matter from plowed-under legumes and grasses and from corn stalks, straw and other crop residues will open and mellow the soil. This helps the soil store more moisture for the use of growing crops.

Then, with the intelligent use of fertilizers, farmers can make each acre produce more profitably. Some farm economists estimate that a dollar devoted to fertilizer use can return from \$2 to \$5 in increased crop value.

★

Radioactive gibberellic acid is being used by researchers at the University of California, Davis, to find out how much, if any, of the plant growth substance will be left in or on the crops at harvest time.

The residue studies are part of a new project headed by Gunter Zweig, associate chemist at Davis. This summer he will measure the gibberellic acid residue, if any, in grapes in the Imperial Valley and at Davis and on potatoes grown from treated seed, also at Davis.

"Before any chemical can be recommended by University researchers," said Mr. Zweig, "complete information on the amount of residue on the crop at harvest must be known. The increasing numbers of insecticides, fungicides, growth hormones, and weed killers being tested have made it impossible for the individual research man to test for resi-

dues. This is the job of the pesticides residue research project."

The gibberellic acid studies are part of some 1,000 tests planned for this year in cooperation with researchers on the Davis and Berkeley campuses.

Along with their residue analyses, Mr. Zweig and his assistants are carrying on a basic research program on action of pesticides in insects and plants and to develop new tests for new chemicals. The gibberellic acid study is tied in with this basic research program. With the help of a grant from Abbott Laboratories, Mr. Zweig is studying various analysis methods for this chemical.

Not satisfied with the presently available radioactive compound, he and James E. DeVay, plant pathologist at Davis, are brewing a "hotter" gibberellic acid with carbon 14, which gives off stronger radioactivity. Since the growth substance is produced by a fungus, it is being synthesized in the laboratory by feeding radioactive sugars to the fungus.

★

Florida citrus is making a comeback from the effects of its big winter freeze, a University of California scientist reports. But the state's avocados have been hit hard.

Between 70 and 80% of Florida's citrus plantings suffered no appreciable tree damage, according to Walter Reuther, horticulturist at Riverside, who returned recently from an inspection of freeze damage there.

"These plantings have come back with a tremendous bloom and appear to have set a bumper crop," he declares. "If this fruit sets as heavily as indications suggest, there will probably be about 75 million boxes of oranges produced in Florida next year. This is three fourths of the normal crop."

Maturity is likely to be one to two weeks later than normal, and sizes may be smaller. Avocado prospects are for only a fourth to a third of last year's crop, Mr. Reuther adds. Avocados are more subject to freeze injury than citrus.

★

Public enemies No. 1, 2 and 3 among Oregon weeds have been identified in a recent survey of Oregon county extension agents. Agents put the finger on Canada thistle, wild morning glory and tansy ragwort as the most persistent weed parasites operating against Oregon farm crops.

Canada thistle was reported a major pest in 22 Oregon counties. Wild morning glory was listed a menace in 17 counties, mostly in the Columbia Basin. Tansy ragwort is a problem in 12 Oregon counties, mainly in the coastal area. Quackgrass was named among the three most troublesome weeds in eight counties, and Russian thistle ranked high in seven counties. White top and gorse also rated the "most unwanted" list as worst pests in three counties.

★

Expenditure of \$300,000 in federal funds for an anti-beet leafhopper re-seeding program in three Idaho areas has been proposed by a Bureau of Land Management Advisory Committee.

The re-seeding program would be conducted in grazing districts around Gooding, Twin Falls and Mountain Home. Some \$150,000 of the sum would be allotted to the grazing district around Mountain Home, with \$75,000 in each of the other two districts.

The re-seeding project is designed to kill the Russian thistle weed, host plant for beet leafhoppers which have caused heavy damage to bean and sugar beet crops in south central Idaho.

OPENS FOR BUSINESS

CALISTOGA, CAL.—The Green Mountain Gardens here recently began operations. The firm, owned by Thomas and Verna Eckart, handles farm and garden supplies.

Western Association To Hear Talk on World Pesticide Market

SAN JOSE, CAL.—The world market for agricultural chemicals will be the subject of a featured address at the annual meeting of the Western Agricultural Chemicals Assn. to be held at the Villa Hotel, San Mateo, October 14-15.

E. T. Collingsworth, president of the Velsicol Chemical Corp., Chicago, will deliver the address during the afternoon session of the group on Oct. 15. A program of "outstanding interest and importance" has been planned by C. O. Barnard, executive secretary of the group.

The first day of the convention will be devoted principally to a golf tournament in the morning, followed by meetings of the board of directors and a general membership meeting when the new directors and officers will be elected.

Business sessions, confined to the second day, will begin with an address by Frank C. Lamb of the Western Research Laboratory of the National Canners Assn. on the subject: "Pesticides and the Canning Industry."

Also appearing before the morning session will be W. C. Jacobsen, director of the California State Department of Agriculture, talking on "Problems of an Agricultural Regulatory Agency." He will be followed by Dr. J. M. Merritt, Merck & Co., Inc., Rahway, N.J., on "Gibberellins in Action," which will include the showing of a short film. The final session of the morning will be led by Dr. Irvin Hall, assistant plant pathologist of the University of California, Citrus Experiment Station, Riverside, talking on "Microbial Control of Insects."

During the afternoon there will be two addresses in addition to that of Mr. Collingsworth. Dr. George R. Ferguson, president of Geigy Agricultural Chemicals, Ardsley, N.Y., will talk on "Technological and Economic Trends in Agriculture." The closing address of the convention will be delivered by Melvin Goldberg, of the Pesticide Advisory Service, New York City, on "The Outlook for Agricultural Chemicals."

U.S.I. Fleet of Tank Cars Gets New Look

NEW YORK—A new tank car painting program has been established by U.S. Industrial Chemicals Co., division of National Distillers and Chemical Corp. The entire U.S.I. fleet of 900 tank cars will be repainted during the next few years, according to Carl A. Greeley, National's vice president in charge of traffic.

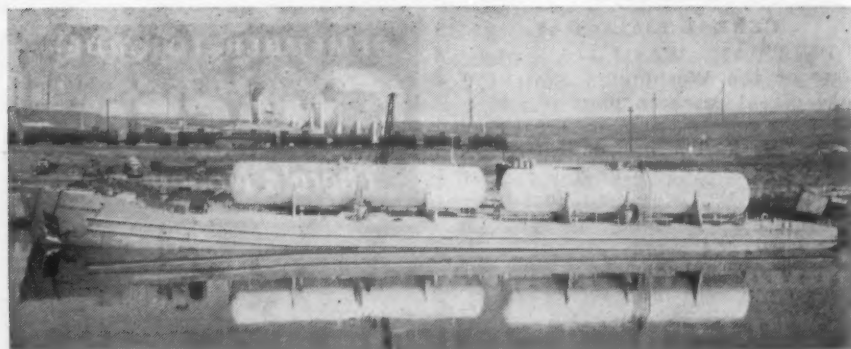
The new look for U.S.I. tank cars, designed by H. R. Loges, National Distillers' director of design and packaging development is a clean-cut black on light gray with the traditional U.S.I. oval in black and red. A color coding system identifies the type of service for which tank cars are used. Domes of the tank cars are painted identifying colors. The colors include black for sulphuric acid, bright orange for phosphatic fertilizer solution and bright red for nitrogen fertilizer solution.

Rain Gives Boost To Crops in Idaho

BOISE—Recent rains have proved very beneficial to most crops in Idaho, the federal crop-weather bulletin reports, although temporarily interrupting field work.

Considerable cut alfalfa hay, however, was damaged. Conversely, some areas of eastern Idaho were suffering from drying winds for the period covered by the bulletin.

"An appreciable amount of winter grain lodged due to rank growth, wind and rain," the bulletin reported.



AMMONIA MARINER—The ocean-going barge, Ammonia Mariner, sits at a moorage at Pasco, Wash., following its arrival from the ocean with the largest single shipment of anhydrous ammonia ever brought to the Columbia river port. Inland trips by the barge are possible only during the period of high water.

Cargo Barge Completes Columbia River Trip

PASCO, WASH.—The largest cargo barge ever to make the 200-mile Columbia River trip from the ocean to Pasco arrived recently with a cargo of anhydrous ammonia.

The barge, Ammonia Mariner SR, built in 1953 and used up to now strictly for ocean voyage, arrived here with its nine storage tanks each loaded with 100 tons of anhydrous ammonia.

The payload of the barge repre-

sents about the equivalent of 80 railroad tank cars.

Jim Barbouletos, terminal manager for Tidewater Shaver Barge Lines, said the high water on the Columbia River made it possible for the barge to make the trip. Such a trip is possible only about two months a year, he said.

Future trips of the Ammonia Mariner up to Pasco will depend on high water conditions or the completion of John Day Dam which will provide extended slack water navigation, Mr. Barbouletos said.

California Cotton Output Up in 1957 Despite Acreage Cut

SAN MARINO, CAL.—Cotton production in California in 1957 exceeded that of 1956, and of the 1946-55 average, in spite of reduced planted acreage, according to the California Fertilizer Assn.

The Association referred to the 1957 cotton crop report of the California Crop and Livestock Reporting Service, which said that the state's 1957 cotton production was 1,537,000 500 lb. bales. This compares with 1,446,000 bales produced in 1956, and with the 1946-55 average of 1,249,000 bales.

In 1957, according to the report, California ranked second in production among the states, and was exceeded only by Texas.

The value of the 1957 California production was \$258,248,000, which exceeded the value of any of the other 246 crops produced commercially in the state, according to the association.

Last year, California's average yield was 1,035 lb. or more than two bales per acre, which was a record high for the state. The previous top production here was 924 lb. per acre in 1956. Arizona just nosed California out of top spot in the nation, with its average production in 1957 of 1,037 lb. per acre. The national average was 388 lb. Cottonseed production was 613,000 tons in 1957, valued at \$32,305,000. The 1956 production was 565,000 tons.

The 711,000 acres of cotton harvested in 1957 compares with 749,000 acres in 1956, and 886,000 acres on the average during the 1948-55 period. California's top cotton acreage was 1,386,000 in 1952, before allocations.

The Association pointed out the fact that improved cultural practices had much to do with the record 1957 cotton production in the face of decreased acreage. Proper use of commercial fertilizers ranked high on the list of these approved practices. It said that fertilizer use increases the volume and the quality of the crop, thus reducing the farmer's per-acre cost of production, and boosting materially his net profit per acre.

CCC Licenses Firm To Make Diluent

QUINCY, ILL.—The Calcium Carbonate Co. here has announced that exclusive license has been granted the Victorville Lime Rock Co., Victorville, Cal. (wholly owned subsidiary of the C. K. Williams Co., East St. Louis, Ill.) for the manufacture and sale of "CCC" diluent under U.S. patents 2668749 and 2786012 in the far western states.

C. F. Lane Appointed To New A.A.C. Position

NEW YORK—C. F. Lane has been named division acid superintendent, southern division, of the American Agricultural Chemical Co., New York, it has been announced by D. S. Parham, vice president, production.

Mr. Lane assumed his new responsibilities on June 1. His duties will comprise acid production at A.A.C. plants at Charleston, S.C., Columbia, S.C., Greensboro, N.C., Montgomery, Ala., Pensacola, Fla., Pierce, Fla. and Savannah Ga.

TOP STUDENT

PORTLAND, ORE.—William Patchey, a junior at Oregon State College, has been granted the Pacific Northwest Plant Food Assn. award as the most outstanding student in the soils department of Oregon State College. Mr. Patchey, of Rainier, Ore. not only had a high grade point average but was outstanding in college activities. He is 27 years of age, married, an ex-service man and plans on working with the Soil Conservation Service this summer.

Gloomicides

The drowning man who was pulled out and revived by a Miami Beach lifeguard. When the rescued man came to, his first words were to his wife: "Tell me, dear, how much should I tip him?"

Sam had backslid again, and his pastor was upbraiding him for it. "Why didn't you say, 'Get behind me, Satan'?"

"I did say dem very words, parson," Sam replied. "Den Satan he say, 'All right Sam, I'll get behind. Since we bofe goin' de same way, hit mek no dif'unce who takes de lead.'"

Nerve: That which enables a man seated in a bus to flirt with a woman who is standing.

"Linda, are you going to watch the moon eclipse tonight?"

The reply was: "I guess so. What channel?"

The most dangerous curves are frequently inside the car.

"Why did you tip that girl so much when she gave you your coat?"

"Look at the coat she gave me!"

A Scotsman bought a nickel's worth of peppermint drops and took his bride for a honeymoon ride on a street car. When they got off the car, he said, "Honey, suppose we save the rest of the candy for the children."

A woman, wishing to lose weight, had been put on a diet by her doctor. One day a friend dropped in and was amazed to behold her tackling with great appetite a large dinner.

"I thought you were on a diet!" exclaimed the visitor.

"So I am," was the reply. "But I've had me diet, and now I'm havin' me dinner."

Two fellows were discussing the chances of henpecked husbands.

"But let me tell you," said one, "I'm

boss at my house. Last night I found there was no hot water. So I raised the roof. Believe me, I got hot water, too—and in a hurry!" There was a pause, and he added: "I hate to wash dishes in cold water, don't you?"

The little brat rode the hobby horse in the toy department for hours. His doting parents pleaded, offered bribes, but to no avail. Their darling wouldn't budge. Finally, jolly ole Santa walked over to the child and whispered into his ear. The kid was off in a jiffy.

On the way home, the curious mother asked, "What did Santa say to you, sweetie, that made you jump off the horse?"

The little brat replied, "He said, 'Get the devil off that horse or I'll break your little neck.'"

A mother, annoyed because her 14-year-old daughter had been calling her boy friend too frequently, took a tip from a former wartime advertisement and posted a sign over the telephone: Is This Call Necessary?

Next day there appeared, pencilled on the card, a brief but logical reply: How Can I Tell 'till I've Made It?

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WEED OF THE WEEK

Mr. Dealer—Cut out this page for your bulletin board

Witch- weed

(*Striga asiatica*)



How to Identify

Witchweed is a deceptively pretty plant, with bright green stem and leaves and showy nasturtium-red flowers having yellow centers. Blossoms are shaped somewhat like violets. The weed grows 6 to 12 inches high, sometimes as tall as 18 inches. The plant has multiple branches, both near the ground and also higher on the plant. Leaves are relatively long and narrow, not much wider than the breadth of the stem. Both leaves and stem have a fuzzy appearance.

Growth Characteristics

Witchweed seeds are minute, requiring about 125 laid end to end to measure an inch. Major difficulty in controlling the plant is seen in its ability to produce from 50,000 to 500,000 of these tiny seeds which can be carried by wind and water, and with soil on shoes and wheels to other fields. This is further complicated by the seed's ability to lie in the soil for as long as 20 years waiting for a host. When such a host (corn, sorghum, other crops) is planted, its presence triggers the germination of the waiting parasitic seeds, the rootlets of which reach out and attach themselves to the roots of the host plant. The advance cells of the parasitic root give off a ferment that softens or dissolves the cell walls of the host tissue so that finger-like tubes can penetrate the nutrient pipelines of the host and the parasite lives and grows on the juices thus stolen.

Effect on Host Crops

Since the host plant is robbed of its nourishment, it wilts and takes on the appearance of being drouth-stricken. However, no amount of rainfall brings relief. Transpiration (giving off moisture) of the attacked plant is reduced by about half and the plant suffers a sudden stunting of growth, turns yellow, then brown, and sooner or later dies. So similar is the effect of witchweed to certain diseases, that the real cause of trouble is often not detected immediately. Damage is compounded in subsequent crop years, but since the weed is relatively new in the U.S. where it was first identified in 1956 in the Carolinas, actual losses have not been great. However, losses in grain-growing regions of the Anglo-Egyptian Sudan have run as high as 66%, with losses of a quarter or third of the crop very common.

Control of Witchweed

Comprehensive research efforts are under way to find means of effective control by both chemical and cultural methods. Experience from countries where the weed has existed longer than in the U.S. has been utilized, including tests to find "trap plants" which emit a "host extract" causing witchweed seeds to germinate but are not themselves hosts. Farmers in all areas should be reminded to watch for witchweed symptoms.

Photo of Witchweed taken by Ralph Mills of North Carolina State College visual aids department and used with permission of N.C. State College.

the quantity of mixtures used on the Continent. Other grades consumed numbered 1,335 and amounted to 317,969 tons (2.21%). The balance (343,961 tons, 2.39%) represented mixtures not reported by grades.

Consumption of mixtures in Hawaii and Puerto Rico amounted to 295,496 tons in 180 grades. While many of the grades in Puerto Rico are similar to those used on the Continent, most of those in Hawaii are designated in fractional numbers.

The 15 grades consumed in largest tonnages in 1956-57 in each of the Continental regions and Puerto Rico are shown in table 5, together with the quantities for each state in the region. At least 11 of the grades in each area were among the 15 consumed in largest tonnages the preceding year, but not always in the same relative order of tonnage.

These grades, in 1956-57, accounted for 50% or more of the total consumption of mixtures in Puerto Rico

and each of the states except California, Colorado, Florida, New Mexico, North Dakota, Washington, and Wyoming. The total tonnages of the 15 grades shown represented 62.1% of the total tonnage of mixtures consumed on the Continent. Approximately one percent of the number of grades used on the Continent represented nearly two-thirds of the total tonnage of mixtures consumed.

In 1955-56 and 1956-57 the 5-10-10 grade was consumed in largest tonnage. Grade 4-12-12 was next in 1956-57 having replaced the 3-12-12 grade which for six years through 1954-55 had been the first grade in tonnage. Though the 5-10-10 grade was consumed in largest tonnage in 1956-57, it represents the class having the ratio of 1:2:2. Grades with a ratio of 1:4:4 (table 6) were most often used in the continental United States in 1956-57 but the second ranking ratio represents the most widely used 5-10-10 grade. The cumulative tonnages of all grades reported in ratios of the 10 listed accounted for 73.5% of the total tonnages of mix-

Table 6. Ratios of Mixtures Used in Largest Tonnage in U.S.

Nutrient ratio*	Consumption		Proportion of quantity of all mixtures	
	1956 Tons	1957 Tons	1956 %	1957 %
1:4:4	2,531,259	2,287,069	17.4	15.8
1:2:2	2,017,107	2,185,187	13.9	15.2
1:1:1	1,578,374	1,783,217	10.9	12.4
1:3:3	1,230,328	1,490,491	8.5	10.3
1:2:1	891,471	836,800	6.1	5.8
0:1:1	563,484	542,682	3.9	3.8
1:3:2	518,145	403,194	3.6	2.8
1:6:6	400,812	371,395	2.7	2.6
4:10:7	470,518	362,853	3.2	2.5
1:4:2	319,089	326,880	2.2	2.3
Total	10,520,587	10,589,768	72.4	73.5

*N:available P₂O₅:K₂O.

tures consumed on the Continent in 1956-57.

The national weighted average of the primary nutrients contained in mixtures in 1956-57 was 5.74% N, 12.36% available P₂O₅, and 11.44% K₂O, a total of 29.54% (table 7). The corresponding values in the preceding year were 5.39, 12.08, 11.20, and 28.67%. The proportionate increase was highest for N (6.49%), while that for available P₂O₅ was but 2.32%, and for K₂O only 2.14%.

Compared with 1955-56 the average primary nutrient content of all mixtures consumed in each of the 51 tabulated areas in 1956-57 showed N increases in 40 and decreases in 11, available P₂O₅ increases or no change in 38 and decreases in 13, K₂O increases or no change in 39 and decreases in 12. As in the preceding year, the West South Central region was the only area in which the average content of each of the nutrients showed an increase in each state. The average grade of mixture consumed in the Pacific region contained 11.9% less K₂O in 1956-57 than in the preceding year.

Table 5—Mixtures Consumed in States and Regions, by Grade

State	Consumption of 15 principal grades in indicated region															Other grades		Total
	Tons															No./	Tons/	
New England																		
	8-12-12	5-10-10	10-10-10	8-16-16	6-9-12	0-20-20	5-10-5	8-9-10	6-3-6	5-8-7	8-12-16	0-15-30	7-7-7	6-10-4	6-8-8			
Maine	52,012	9,521	17,358	16,172	24,754	2,092	380	10,699	0	1,863	9,203	131	169	224	0	47	18,671	
New Hampshire	919	2,406	2,378	4,993	13	498	135	0	0	656	0	1,808	548	339	0	27	1,033	
Vermont	422	6,109	5,519	7,096	0	13,925	40	0	0	107	0	2,568	307	31	0	30	1,897	
Massachusetts	1,455	16,865	10,405	5,638	0	581	2,537	0	3,734	4,684	0	1,410	4,412	2,699	1,103	28	13,378	
Rhode Island	159	7,768	1,004	192	0	230	234	0	0	439	0	296	602	649	97	25	14,999	
Connecticut	1,531	9,614	8,800	2,890	0	1,108	8,865	0	6,201	1,887	0	1,011	2,240	1,768	1,272	68	11,092	
Total	56,538	52,283	45,484	36,961	24,767	18,434	12,192	10,699	10,635	9,636	9,203	8,604	8,298	5,706	4,472	88	49,281	
Middle Atlantic																		
	5-10-10	5-10-5	10-10-10	3-12-6	8-16-16	0-20-20	6-12-12	3-12-12	2-12-12	6-12-6	4-8-12	4-12-12	6-10-4	0-14-14	5-10-15			
New York	139,783	107,655	61,770	2,895	46,820	16,196	14,497	2,657	27	26,469	2,582	74	8,604	2,332	7,393	75	99,308	
New Jersey	128,025	24,770	9,774	1,060	2,391	2,539	5,469	1,633	66	1,361	490	415	6,371	2,967	1,871	77	60,771	
Pennsylvania	256,960	20,771	60,639	49,280	29,435	32,965	8,281	15,382	6,983	1,590	7,318	14,972	5,042	4,942	1,665	113	52,679	
Delaware	38,216	1,068	8,041	726	3,822	2,042	2,443	933	5,005	5	570	1,940	147	4,739	7,157	69	8,034	
Dist. of Col.	84	590	3	0	0	0	0	0	0	0	0	0	0	0	0	13	453	
Maryland	99,293	27,081	22,140	28,067	5,690	6,124	2,149	9,413	15,473	30	14,855	5,505	1,060	5,390	1,394	96	33,083	
Rhode Island	24,120	2,492	3,763	8,377	229	6,159	244	416	2,852	58	3	60	700	2,399	86	47	9,768	
Total	698,491	184,426	165,130	90,366	88,413	66,032	33,383	30,434	30,408	29,496	25,826	22,966	22,232	30,319	19,966	181	224,096	
South Atlantic																		
	8-12-12	3-9-9	5-10-10	2-12-12	4-8-8	3-9-6	4-8-6	5-10-5	4-7-5	4-10-6	6-8-6	6-6-6	8-8-8	4-8-10	3-12-12			
Virginia	11,934	37,295	156,369	168,618	2	28,322	0	66,035	0	0	11,720	0	6,875	6,785	0	43	173,376	
North Carolina	15,850	266,853	303,947	148,212	11	144,051	0	16,880	0	2,930	51,077	0	30,477	47,403	7	28	188,049	
South Carolina	61,036	145,415	87,904	0	20,803	17,331	0	35,934	0	102,598	4,733	0	6,336	8	73,081	39	69,459	
Georgia	601,431	78,011	7,325	13,735	101,278	996	106,290	3,601	0	24	86,518	0	5,008	5	452	39	109,065	
Florida	34,285	5,992	5,666	5,213	75,121	0	36,493	6,738	118,792	444	5,519	24,771	40,729	32,199	2,438	977	952,176	
Total	726,536	527,569	501,211	336,478	196,687	190,702	142,783	129,188	118,792	105,956	99,561	94,771	89,475	86,594	75,978	994	1,390,325	
East North Central																		
	3-12-12	5-20-20	4-16-16	12-12-12	10-10-10	0-20-20	5-10-10	1-9-27	0-10-30	3-18-9	6-24-24	6-24-12	6-12-12	10-6-4	8-32-0			
Ohio	337,889	116,325	51,367	86,889	65,491	32,134	108,643	1,135	1,103	17,904	3,061	10,469	12,532	12,111	843	131	101,112	
Indiana	112,025	170,880	208,661	97,438	86,990	51,384	17,864	10,953	4,241	1,063	4,085	4,111	2,255	10,571	130	89	89,994	
Illinois	377	570	9,192	24,201	53,494	80,411	19,867	20,908	4,065	650	8,139	2,064	3,707	2,156	5,712	108	95,408	
Michigan	108,110	116,117	93,137	62,541	34,010	12,561	3,629	3,121	3,151	12,831	1,589	13,641	7,238	11,587	594	89	73,953	
Wisconsin	24,133	104,376	43,598	7,183	20,089	31,588	0	16,240	28,822	780	13,838	352	2,590	304	424	76	55,517	
Total	680,698	561,809	490,064	327,745	298,951	139,734	109,466	59,268	45,394	36,408	35,850	30,641	29,886	28,413	26,144	240	415,964	
West North Central																		
	12-12-12	5-20-20	6-24-12	10-10-10	8-24-8	3-12-12	5-20-10	0-20-20	10-20-0	4-16-16	8-32-0	4-12-4	8-8-8	8-24-12	10-20-10			
Minnesota	5,902	86,990	67,313	10,015	0	690	5,406	16,873	2,142	15,281	6,617	0	55	16,945	219	103	91,783	
Iowa	20,999	34,370	3,088	33,760	409	9,696	41,498	9,150	10,493	7,438	10,362	35	51	112	3,143	57	62,437	
Missouri	177,609	16,443	0	13,811	35,359	40,971	0	15,812	28	6,116	1,309	23,793	25,956	5,188	0	0	307,461	
North Dakota	377	570	3,049	55	45	0	24	154	103	1,974	0	0	1,407	75	58	22	10,186	
South Dakota	37	19	389	147	0	0	34	2,402	6	2,965	0	0	0	13	38	40	9,730	
Nebraska	601	521	197	216	399	9	760	534	4,090	0	4,439	18	5	0	1,821	83	11,159	
Kansas	3,289	373	20	89	12,962	271	32	615	12,025	51	1,422	1,092	895	0	5,920	49	31,611	
Total	208,774	199,046	74,016	56,695	56,089	51,982	47,696	43,098	31,893	28,997	27,777	26,070	25,982	18,477	15,818	283	305,355	
East South Central																		
	4-10-7	6-12-12	6-8-8	4-12-12	5-10-15	4-12-8	5-10-5	0-14-13	1-9-6	3-12-12	0-16-8	10-10-10	5-10-10	8-8-8	6-8-6			
Kentucky	502	24,123	20	359	95,776	99,460	2,070	210	13,422	39,432	0	30,802	15,213	1,344	26,107	98	88,636	
Tennessee	52	247,790	1,727	1,216	14,998	6,642	4,132	34	46,996	8,157	78	4,062	12,765	2,039	1,352	88	70,640	
Alabama	114,420	71,722	7,776	190,405	0	660	71,270	0	0	40,473	3,994	1	14,283	29	53	10	40,186	
Mississippi	5,707	2,372	132,775	14	0	81,296	6,646	0	0	2,018	615	1,020	11,124	10,094	27	42	42,007	
Total	320,718	274,316	213,420	193,994	110,708	106,102	69,058	76,469	60,378	49,627	41,166	39,868	39,063	27,700	27,515	166	241,469	
West South Central																		
	5-10-5	10-20-10	8-8-8	12-12-12	12-24-12	3-12-12	4-12-4	10-20-0	6-8-12	13-11-13	6-24-24	5-20-20	6-8-8	0-20-20	5-10-10			
Arkansas	32,233	21,399	2,414	11,562	719	754	184	14,504	4,497	2,922	1,473	16	8,190	1,631	63	37	37,001	
Louisiana	22,061	3,408	30,317	20,404	1,694	17,699	7,572	0	1,186	7,884	8,601	10,985	2,593	8,717	51	13	13,233	
Oklahoma	20,003	17,846	243	479	2,665	273	2,070	5,703	4,869	409	325	39	75	29	28	89	1,880	
Texas	95,005	69,113	13,175	5,785	16,118	822	5,227	10,244	27	6,767	1,709	2,267	111	23	2,819	184	42,382	
Total	169,302	111,766	46,149	38,230	21,156	19,535	16,184	15,874	15,721	15,600	12,984	12,646	11,151	11,051	8,097	188	107,091	
Mountain																		
	10-20-0	20-20-0	10-20-5	24-20-0	6-10-4	20-10-0	10-20-10	18-2-0	10-18-5	10-10-10	10-10-0	10-16-8	14-14-14	6-30-0	12-12-12			
Montana	2,037	260	0	0	130	43	1	0	885	0	0	0	90	566	0	19	515	
Idaho	184	873	0	3,134	226	190	0	0	180	0	0	893	92	128	273	50	2,121	
Wyoming	185	136	0	0	40	31	5	0	25	0	0	0	0	0	0	21	845	
Colorado	497	896	0	0	850	185	360	0	889	187	0	1,087	299	59	380	64	6,298	
New Mexico	87	334	0	0	19	135	3	0	15	28	0	0	0	0	19	24	889	
Arizona	2,348	3,996	0	0	230	1,786	1,786	1,457	0	1,118	1,347	0	349	0	0	53	5,945	
Utah	531	0	0	813	2,309	0	0	0	183	0	0	0	4	0	61	31	1,058	
Nevada	63	0	0	0	681	45	0	0	202	1	0	0	0	0	0	18	1,269	
Total	5,932	5,805	4,113	3,996	3,905	2,883	2,878	1,697	1,503	1,585	1,408	1,384	1,089	808	705	158	17,999	
Pacific																		
	10-10-10	10-10-5	17-0-0	6-10-4	8-8-4	4-4-2	8-10-12	12-8-0	10-16-8	10-20-20	6-20-20	8-12-0	5-1-2	5-10-10	6-9-6			
Washington	931	108	1	3,321	0	0	0	0	130	3,461	1,638	973	4,422	3,050	0	86	18,848	
Oregon	368	2	0	3,380	0	0	0	0	5	1,561	3,309	3,831	230	913	0	65	10,679	
California	24,619	23,252	20,729	7,132	12,659	8,049	7,874	6,436	0	5,002	4,947	4,804	4,652	3,565	3,758	115	197,099	
Total	25,918	23,368	20,738	14,040	12,958	8,049	7,877	6,436	5,362	5,002	4,947	4,804	4,652	3,565	3,758	115	197,099	
Territories/																		
	14-4-10	9-10-5	14-2-8	19-4-7	10-10-8	12-4-10	13-3-12	12-6-10	8-6-10	12-3-16	6-8-10	10-6-20	16-4-5	5-7-20	12-2-10			
Puerto Rico	47,975	41,755	18,997	18,823	11,303	10,013	9,533	9,313	8,582	8,348	7,468	7,385	4,375	4,160	3,855	27	18,872	
Continental United States																		
	5-10-10	4-12-12	3-12-12	5-20-20	10-10-10	12-12-12	5-10-5	1-9-9	4-16-16	6-12-12	8-12-12	4-10-7	0-20-20	6-8-8	1-9-6			
New England	56,538	52,283	45,484	36,961	24,767	18,434	12,192	10,699	10,635	9,636	9,203	8,604	8,298	5,706	4,472	88	224,096	
Middle Atlantic	698,491	184,426	165,130	90,366	88,413	66,												

Table 9. Classes of Materials, Used in Years Ended June 30, 1956 and 1957

State and region	Percent				Total in nutrient and materials			
	Mixtures ^{2/}				Materials			
	N ^{1/}	Available P ₂ O ₅	K ₂ O	Total	Single nutrient ^{3/}		Multiple nutrient ^{2/}	Total nutrients
					N	Available P ₂ O ₅	K ₂ O	
Maine	7.56	11.76	19.68	32.00	32.64	19.92	48.57	10.82
New Hampshire	6.53	13.08	14.07	33.68	29.67	20.43	58.28	11.66
Vermont	4.19	15.74	16.86	36.79	34.29	20.57	60.52	14.06
Massachusetts	6.82	10.04	10.57	27.43	17.70	19.87	61.19	11.22
Rhode Island	5.59	10.54	10.56	27.02	20.38	18.65	50.31	9.02
Connecticut	6.29	10.10	10.01	26.40	23.53	22.61	52.67	18.07
New England	6.74	11.56	12.22	30.52	29.60	20.56	57.50	11.96
New York	6.53	10.22	10.09	26.84	26.53	22.57	51.55	10.49
New Jersey	5.46	10.60	10.36	26.36	24.37	21.32	51.66	11.82
Pennsylvania	5.36	12.18	11.94	29.48	29.86	20.55	52.14	12.59
Delaware	5.13	11.70	12.46	29.29	29.97	22.77	60.97	12.55
District of Columbia	5.59	10.06	5.14	21.19	10.89	20.39	60.37	9.61
Maryland	4.90	10.23	10.18	25.31	16.67	14.47	54.33	14.33
West Virginia	4.51	12.04	10.70	27.25	28.16	21.56	66.86	9.03
Middle Atlantic	5.54	11.79	10.90	28.23	27.31	21.33	51.65	11.57
Virginia	4.02	11.08	10.94	26.04	23.27	26.17	15.32	16.34
North Carolina	4.21	9.54	9.92	23.67	24.36	17.05	38.85	14.90
South Carolina	3.90	9.93	9.69	23.60	21.02	15.31	58.57	18.61
Georgia	4.83	10.41	10.70	25.94	25.87	16.74	57.69	29.50
Florida	5.86	6.90	8.27	21.33	21.53	15.85	51.31	16.15
South Atlantic	5.74	2.27	2.94	21.25	23.69	15.03	41.13	17.31
Ohio	3.25	14.32	13.55	31.19	33.00	24.13	56.52	19.95
Indiana	5.63	16.43	15.81	37.78	36.38	20.43	60.17	42.08
Illinois	6.97	15.09	14.39	36.05	32.99	7.79	60.90	26.55
Michigan	6.17	15.57	14.80	36.54	39.00	19.69	52.45	13.19
Wisconsin	4.17	16.15	12.48	32.80	47.31	22.24	58.92	15.36
East North Central	5.61	15.44	15.17	35.22	35.09	9.24	60.19	20.56
Minnesota	5.67	18.15	15.00	42.75	53.75	41.86	58.59	45.71
Iowa	6.71	21.38	13.27	39.35	38.15	48.10	51.82	38.28
Missouri	6.60	14.63	12.90	35.81	34.68	6.54	60.50	21.27
North Dakota	11.37	27.59	5.36	44.30	40.50	45.29	60.12	49.25
South Dakota	11.24	24.62	1.63	37.49	43.30	43.45	60.37	44.22
Nebraska	9.59	20.50	4.26	36.75	55.06	43.82	60.39	44.87
Kansas	10.21	24.09	5.45	40.52	32.62	42.12	60.31	43.26
West North Central	4.62	18.68	12.56	35.85	46.22	21.52	59.85	44.50
Kentucky	7.69	11.85	12.04	29.78	34.83	22.46	34.90	15.85
Tennessee	5.42	11.96	11.40	29.78	30.12	30.12	34.90	16.96
Alabama	3.72	11.18	9.75	24.65	25.11	12.56	60.15	38.19
Mississippi	5.27	2.89	8.53	24.32	37.14	13.19	60.18	32.32
East South Central	4.72	11.30	10.44	26.46	32.70	16.02	50.74	26.37
Arkansas	6.48	14.27	13.42	34.17	36.34	30.59	60.11	38.92
Louisiana	6.73	14.56	10.79	32.04	39.58	32.21	58.55	37.08
Oklahoma	8.00	17.32	7.04	32.40	39.99	25.68	50.50	32.21
Texas	12.10	16.71	7.47	36.52	47.88	32.50	39.62	40.97
West South Central	4.40	15.70	1.73	32.82	41.77	28.14	52.71	36.68
Montana	11.08	20.40	2.12	33.61	37.09	43.73	60.06	47.31
Idaho	17.50	18.89	2.60	39.15	30.69	41.79	60.89	41.86
Wyoming	12.85	18.93	2.52	34.30	50.73	44.47	60.40	61.24
Colorado	12.13	19.67	7.38	39.19	50.04	45.31	46.75	51.17
New Mexico	11.90	15.82	4.48	31.20	43.09	48.80	53.08	43.59
Arizona	13.91	16.26	3.39	33.56	37.45	53.08	53.08	57.21
Utah	10.64	14.42	4.80	29.86	32.50	39.13	60.32	35.75
Nevada	8.26	10.45	4.02	23.53	28.45	42.37	52.64	33.30
Mountain	11.39	17.62	3.24	34.25	37.40	40.86	51.44	36.87
Washington	8.36	12.74	8.71	29.81	37.63	34.40	54.98	35.21
Oregon	8.59	16.12	8.67	33.50	27.69	22.26	57.98	37.00
California	10.82	10.21	5.61	26.54	29.86	26.48	55.20	13.24
Pacific	10.29	10.98	6.21	27.48	30.50	26.06	55.57	15.80
Continental U. S.	5.61	12.47	11.45	29.54	33.00	17.87	55.03	24.05
Hawaii	11.74	8.90	17.01	37.65	28.44	24.07	59.28	56.79
Puerto Rico	11.76	5.98	9.27	27.15	22.04	21.90	55.88	21.32
Territories	11.76	6.55	11.17	29.48	21.52	24.05	59.24	50.27
U. S. Averages:								
1956-57	5.74	12.36	11.44	29.54	32.68	17.92	55.20	24.14
1954-55	5.79	12.36	11.39	29.54	32.68	17.92	55.20	24.14
1954-55	5.28	11.05	10.80	27.90	30.00	19.37	54.56	21.64
1954-55	5.28	11.05	10.80	27.90	30.00	19.37	54.56	21.64

1/ Excluding fertilizers not guaranteed to contain one or more of the primary plant nutrients, N, P₂O₅, or K₂O.
2/ Guaranteed to contain two or more of the primary plant nutrients. 3/ Guaranteed to contain one of the primary plant nutrients. 4/ Including 2 percent of the colloidal phosphate and 3 percent of the phosphate rock marketed for direct application. 5/ Revised.

in Missouri accounting for most of the change. The 22% and under grades of superphosphate decreased 47,028 tons (7.7%) from the use of 1955-56 with the East South Central, West North Central, and Mountain regions showing the least change. However, the use of grades of superphosphate containing over 22% P_2O_5 increased 48,246 tons (14.8%). It appeared that more superphosphate was used rather than higher grades being substituted for lower grades.

Most of the potash materials used for direct application showed an increase in 1956-57 when compared with the consumption in the preceding year. The use of potassium-sodium nitrate appears to have decreased from 20,680 tons in 1955-56 to 9,373 tons in 1956-57, but this may be the result of some of this product having been reported as a mixture. The increase (9,561 tons) in use of mixtures corresponding to grades of this product would nearly account for the decreased tonnage.

The use of the 58-62% grades of potassium chloride, which comprised 80% of the total consumption of potash materials, increased from 309,230 tons in 1955-56 to 370,531 tons in 1956-57 being most significant in the East North Central region and especially in the states of Indiana and Illinois.

The use of secondary and trace nutrient materials, except gypsum, sold through fertilizer manufacturers was relatively the same in both years. Use of gypsum, comprising 94% of the total tonnage of this class of products, increased from 738,499 tons in 1955-56 to 891,317 tons in 1956-57 adding 152,818 tons to the total increased tonnage (515,041) of all fertilizers shown for 1956-57 season.

The weighted average primary nutrient content of the various classes of materials consumed is shown in table 7. These averages are based on the composition and tonnage of the individual materials comprising the respective classes. In 1956-57, the national averages of materials containing only N, P_2O_5 , or K_2O , were 32.62, 17.92 (available P_2O_5), and 55.20%, respectively: of multiple-

nutrient materials 24.14, and for all materials 28.81%. The corresponding averages for these classes in 1955-56 were 32.36 (revised), 16.55, 55.64, 22.71, and 27.44% (revised). The higher national averages for most of the classes in 1956-57 reflect generally the greater use of the higher analysis products. The lower average for K_2O results from the large increases in the tonnage of lime-potash which contains only 6% of K_2O .

Primary Plant Nutrients

Fertilizers (mixtures and direct application materials) consumed in 1956-57 contained a total of 6,377,541 tons of N, available P_2O_5 , and K_2O

(Continued on next page)

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Table 8—Materials Consumed for Direct Application

State and region	Tons																				Chemical nitrogen materials										Fertilizer materials										Fertilizer materials										Fertilizer materials																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	Ammonia (anhydrous)										Ammonia nitrate										Ammonia nitrate-nitrogen										Ammonia sulfate										Calcium cyanamide										Urea										Other										Natural organic										Phosphate rock										Superphosphate										Other										Chlorine										Total primary										Secondary and trace																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	1946-57	1958-59	1960-61	1962-63	1964-65	1966-67	1968-69	1970-71	1972-73	1974-75	1976-77	1978-79	1980-81	1982-83	1984-85	1986-87	1988-89	1990-91	1992-93	1994-95	1996-97	1998-99	2000-01	2002-03	2004-05	2006-07	2008-09	2010-11	2012-13	2014-15	2016-17	2018-19	2020-21	2022-23	2024-25	2026-27	2028-29	2030-31	2032-33	2034-35	2036-37	2038-39	2040-41	2042-43	2044-45	2046-47	2048-49	2050-51	2052-53	2054-55	2056-57	2058-59	2060-61	2062-63	2064-65	2066-67	2068-69	2070-71	2072-73	2074-75	2076-77	2078-79	2080-81	2082-83	2084-85	2086-87	2088-89	2090-91	2092-93	2094-95	2096-97	2098-99	2100-01	2102-03	2104-05	2106-07	2108-09	2110-11	2112-13	2114-15	2116-17	2118-19	2120-21	2122-23	2124-25	2126-27	2128-29	2130-31	2132-33	2134-35	2136-37	2138-39	2140-41	2142-43	2144-45	2146-47	2148-49	2150-51	2152-53	2154-55	2156-57	2158-59	2160-61	2162-63	2164-65	2166-67	2168-69	2170-71	2172-73	2174-75	2176-77	2178-79	2180-81	2182-83	2184-85	2186-87	2188-89	2190-91	2192-93	2194-95	2196-97	2198-99	2200-01	2202-03	2204-05	2206-07	2208-09	2210-11	2212-13	2214-15	2216-17	2218-19	2220-21	2222-23	2224-25	2226-27	2228-29	2230-31	2232-33	2234-35	2236-37	2238-39	2240-41	2242-43	2244-45	2246-47	2248-49	2250-51	2252-53	2254-55	2256-57	2258-59	2260-61	2262-63	2264-65	2266-67	2268-69	2270-71	2272-73	2274-75	2276-77	2278-79	2280-81	2282-83	2284-85	2286-87	2288-89	2290-91	2292-93	2294-95	2296-97	2298-99	2300-01	2302-03	2304-05	2306-07	2308-09	2310-11	2312-13	2314-15	2316-17	2318-19	2320-21	2322-23	2324-25	2326-27	2328-29	2330-31	2332-33	2334-35	2336-37	2338-39	2340-41	2342-43	2344-45	2346-47	2348-49	2350-51	2352-53	2354-55	2356-57	2358-59	2360-61	2362-63	2364-65	2366-67	2368-69	2370-71	2372-73	2374-75	2376-77	2378-79	2380-81	2382-83	2384-85	2386-87	2388-89	2390-91	2392-93	2394-95	2396-97	2398-99	2400-01	2402-03	2404-05	2406-07	2408-09	2410-11	2412-13	2414-15	2416-17	2418-19	2420-21	2422-23	2424-25	2426-27	2428-29	2430-31	2432-33	2434-35	2436-37	2438-39	2440-41	2442-43	2444-45	2446-47	2448-49	2450-51	2452-53	2454-55	2456-57	2458-59	2460-61	2462-63	2464-65	2466-67	2468-69	2470-71	2472-73	2474-75	2476-77	2478-79	2480-81	2482-83	2484-85	2486-87	2488-89	2490-91	2492-93	2494-95	2496-97	2498-99	2500-01	2502-03	2504-05	2506-07	2508-09	2510-11	2512-13	2514-15	2516-17	2518-19	2520-21	2522-23	2524-25	2526-27	2528-29	2530-31	2532-33	2534-35	2536-37	2538-39	2540-41	2542-43	2544-45	2546-47	2548-49	2550-51	2552-53	2554-55	2556-57	2558-59	2560-61	2562-63	2564-65	2566-67	2568-69	2570-71	2572-73	2574-75	2576-77	2578-79	2580-81	2582-83	2584-85	2586-87	2588-89	2590-91	2592-93	2594-95	2596-97	2598-99	2600-01	2602-03	2604-05	2606-07	2608-09	2610-11	2612-13	2614-15	2616-17	2618-19	2620-21	2622-23	2624-25	2626-27	2628-29	2630-31	2632-33	2634-35	2636-37	2638-39	2640-41	2642-43	2644-45	2646-47	2648-49	2650-51	2652-53	2654-55	2656-57	2658-59	2660-61	2662-63	2664-65	2666-67	2668-69	2670-71	2672-73	2674-75	2676-77	2678-79	2680-81	2682-83	2684-85	2686-87	2688-89	2690-91	2692-93	2694-95	2696-97	2698-99	2700-01	2702-03	2704-05	2706-07	2708-09	2710-11	2712-13	2714-15	2716-17	2718-19	2720-21	2722-23	2724-25	2726-27	2728-29	2730-31	2732-33	2734-35	2736-37	2738-39	2740-41	2742-43	2744-45	2746-47	2748-49	2750-51	2752-53	2754-55	2756-57	2758-59	2760-61	2762-63	2764-65	2766-67	2768-69	2770-71	2772-73	2774-75	2776-77	2778-79	2780-81	2782-83	2784-85	2786-87	2788-89	2790-91	2792-93	2794-95	2796-97	2798-99	2800-01	2802-03	2804-05	2806-07	2808-09	2810-11	2812-13	2814-15	2816-17	2818-19	2820-21	2822-23	2824-25	2826-27	2828-29	2830-31	2832-33	2834-35	2836-37	2838-39	2840-41	2842-43	2844-45	2846-47	2848-49	2850-51	2852-53	2854-55	2856-57	2858-59	2860-61	2862-63	2864-65	2866-67	2868-69	2870-71	2872-73	2874-75	2876-77	2878-79	2880-81	2882-83	2884-85	2886-87	2888-89	2890-91	2892-93	2894-95	2896-97	2898-99	2900-01	2902-03	2904-05	2906-07	2908-09	2910-11	2912-13	2914-15	2916-17	2918-19	2920-21	2922-23	2924-25	2926-27	2928-29	2930-31	2932-33	2934-35	2936-37	2938-39	2940-41	2942-43	2944-45	2946-47	2948-49	2950-51	2952-53	2954-55	2956-57	2958-59	2960-61	2962-63	2964-65	2966-67	2968-69	2970-71	2972-73	2974-75	2976-77	2978-79	2980-81	2982-83	2984-85	2986-87	2988-89	2990-91	2992-93	2994-95	2996-97	2998-99	3000-01	3002-03	3004-05	3006-07	3008-09	3010-11	3012-13	3014-15	3016-17	3018-19	3020-21	3022-23	3024-25	3026-27	3028-29	3030-31	3032-33	3034-35	3036-37	3038-39	3040-41	3042-43	3044-45	3046-47	3048-49	3050-51	3052-53	3054-55	3056-57	3058-59	3060-61	3062-63	3064-65	3066-67	3068-69	3070-71	3072-73	3074-75	3076-77	3078-79	3080-81	3082-83	3084-85	3086-87	3088-89	3090-91	3092-93	3094-95	3096-97	3098-99	3100-01	3102-03	3104-05	3106-07	3108-09	3110-11	3112-13	3114-15	3116-17	3118-19	3120-21	3122-23	3124-25	3126-27	3128-29	3130-31	3132-33	3134-35	3136-37	3138-39	3140-41	3142-43	3144-45	3146-47	3148-49	3150-51	3152-53	3154-55	3156-57	3158-59	3160-61	3162-63	3164-65	3166-67	3168-69	3170-71	3172-73	3174-75	3176-77	3178-79	3180-81	3182-83	3184-85	3186-87	3188-89	3190-91	3192-93	3194-95	3196-97	3198-99	3200-01	3202-03	3204-05	3206-07	3208-09	3210-11	3212-13	3214-15	3216-17	3218-19	3220-21	3222-23	3224-25	3226-27	3228-29	3230-31	3232-33	3234-35	3236-37	3238-39	3240-41	3242-43	3244-45	3246-47	3248-49	3250-51	3252-53	3254-55	3256-57	3258-59	3260-61	3262-63	3264-65	3266-67	3268-69	3270-71	3272-73	3274-75	3276-77	3278-79	3280-81	3282-83	3284-85	3286-87	3288-89	3290-91	3292-93	3294-95	3296-97	3298-99	3300-01	3302-03	3304-05	3306-07	3308-09	3310-11	3312-13	3314-15	3316-17	3318-19	3320-21	3322-23	3324-25	3326-27	3328-29	3330-31	3332-33	3334-35	3336-37	3338-39	3340-41	3342-43	3344-45	3346-47	3348-49	3350-51	3352-53	3354-55	3356-57	3358-59	3360-61	3362-63	3364-65	3366-67	3368-69	3370-71	3372-73	3374-75	3376-77	3378-79	3380-81	3382-83	3384-85	3386-87	3388-89	3390-91	3392-93	3394-95	3396-97	3398-99	3400-01	3402-03	3404-05	3406-07	3408-09	3410-11	3412-13	3414-15	3416-17	3418-19	3420-21	3422-23	3424-25	3426-27	3428-29	3430-31	3432-33	3434-35	3436-37	3438-39	3440-41	3442-43	3444-45	3446-47	3448-49	3450-51	3452-53	3454-55	3456-57	3458-59	3460-61	3462-63	3464-65	3466-67	3468-69	3470-71	3472-73	3474-75	3476-77	3478-79	3480-81	3482-83	3484-85	3486-87	3488-89	3490-91	3492-93	3494-95	3496-97	3498-99	3500-01	3502-03	3504-05	3506-07	3508-09	3510-11	3512-13	3514-15	3516-17	3518-19	3520-21	3522-23	3524-25	3526-27	3528-29	3530-31	3532-33	3534-35	3536-37	3538-39	3540-41	3542-43	3544-45	3546-47	3548-49	3550-51	3552-53	3554-55	3556-57	3558-59	3560-61	3562-63	3564-65	3566-67	3568-69	3570-71	3572-73	3574-75	3576-77	3578-79	3580-81	3582-83	3584-85	3586-87	3588-89	3590-91	3592-93	3594-95	3596-97	3598-99	3600-01	3602-03	3604-05	3606-07	3608-09	3610-11	3612-13	3614-15	3616-17	3618-19	3620-21	3622-23	3624-25	3626-27	3628-29	3630-31	3632-33	3634-35	3636-37	3638-39	3640-41	3642-43	3644-45	3646-47	3648-49	3650-51	3652-53	3654-55	3656-57	3658-59	3660-61	3662-63	3664-65	3666-67	3668-69	3670-71	3672-73	3674-75	3676-77	3678-79	3680-81	3682-83	3684-85	3686-87	3688-89	3690-91	3692-93	3694-95	3696-97	3698-99	3700-01	3702-03	3704-05	3706-07	3708-09	3710-11	3712-13	3714-15	3716-17	3718-19	3720-21	3722-23	3724-25	3726-27	3728-29	3730-31	3732-33	3734-35	3736-37	3738-39	3740-41	3742-43	3744-45	3746-47	3748-49	3750-51	3752-53	3754-55	3756-57	3758-59	3760-61	3762-63	3764-65	3766-67	3768-69	3770-71	3772-73	3774-75	3776-77	3778-79	3780-81	3782-83	3784-85	3786-87	3788-89	3790-91	3792-93	3794-95	3796-97	3798-99	3800-01	3802-03	3804-05	3806-07	3808-09	3810-11	3812-13	3814-15	3816-17	3818-19	3820-21	3822-23	3824-25	3826-27	3828-29	3830-31	3832-33	3834-35	3836-37	3838-39	3840-41	3842-43	3844-45	3846-47	3848-49	3850-51	3852-53	3854-55	3856-57	3858-59	3860-61	3862-63	3864-65	3866-67	3868-69	3870-71	3872-73	3874-75	3876-77	3878-79	3880-81	3882-83	3884-85	3886-87	3888-89	3890-91	3892-93	3894-95	3896-97	3898-99	3900-01	3902-03	3904-05	3906-07	3908-09	3910-11	3912-13	3914-15	3916-17	3918-19	3920-21	3922-23	3924-25	3926-27	3928-29	3930-31	3932-33	3934-35	3936-37	3938-39	3940-41	3942-43	3944-45	3946-47	3948-49	3950-51	3952-53	3954-55	3956-57	3958-59	3960-61	3962-63	3964-65	3966-67	3968-69	3970-71	3972-73	3974-75

1/ Includes 15,000 tons distributed by Government agencies for test demonstration. Excludes lime and the quantities used for manufacture of commercial mixtures. 2/ Includes estimated phosphate quantity of which is shown separately in table 1, by regions. 3/ Includes an estimated 950,000 tons of dried manure. 4/ Navigation tonnage was added as follows:

Class	Consumption		Change in consumption	
	1956	1957	Tons	%
Chemical nitrogen materials	3,272,852	3,706,428	433,576	13.2
Natural organic materials	472,706	479,671	6,965	1.5
Phosphate materials	2,478,315	2,415,963	-62,352	-2.5
Potash materials	404,839	460,899	56,060	13.8
Secondary and trace nutrient materials	789,605	943,243	153,638	19.5
Total	7,418,317	8,006,204	587,887	7.9

**Table 10. Change in Consumption of Nitrogen Materials
in 1956-57 from 1955-56**

Kind	Change in consumption	
	Tons	%
Ammonia, anhydrous	33,348	8.0
Ammonia, aqua	71,484	23.1
Ammonium nitrate	164,530	17.5
Ammonium nitrate-lime mixture	—13,342	—4.2
Ammonium sulfate	101,785	24.6
Calcium cyanamide	—18,840	—28.6
Calcium nitrate	—5,052	—9.1
Nitrogen solutions	136,983	125.8
Sodium nitrate	—49,645	—9.1
Urea	16,543	17.9
Other	—4,218	—46.4
Total	433,576	13.2

Table 11—Consumption of Plant Nutrients in Combined Mixtures and Materials

State and region	Consumption of nutrients in mixtures						Consumption of nutrients in mixtures and materials					
	Fats		Total B, avail. Fats, and K ₂ O		Fats		Fats		Total B, avail. Fats, and K ₂ O			
	Available	Total	K ₂ O	Total	Available	Total	Available	Total	K ₂ O	Total		
Maine	12,342	19,197	19,995	20,702	52,281	11,817	19,911	20,697	20,805	59,133		
New Hampshire	980	1,979	2,044	2,128	5,095	1,467	2,816	2,446	8,211	6,098		
Vermont	1,593	5,983	6,163	6,411	13,987	2,014	2,816	5,518	6,577	17,807		
Massachusetts	4,698	7,948	8,128	8,376	18,067	2,816	5,518	7,782	11,817	30,468		
Rhode Island	885	1,576	1,659	1,779	9,040	1,094	1,666	1,768	1,635	4,355		
Connecticut	3,861	6,361	6,672	6,983	16,632	2,672	5,518	6,402	7,160	20,468		
New York	28,469	42,018	44,063	46,108	110,938	39,358	126,310	128,360	130,410	393,538		
New Jersey	35,556	60,996	64,556	68,116	143,969	40,614	69,780	78,203	57,709	166,103		
Pennsylvania	13,049	26,085	26,813	27,536	64,738	17,007	27,579	28,436	29,831	69,687		
Delaware	30,485	69,219	71,091	72,963	167,588	35,949	71,007	80,911	69,066	180,018		
Middle Atlantic	4,951	9,698	10,178	10,658	33,567	11,482	19,911	20,697	10,356	29,807		
Virginia	106	178	190	201	375	146	213	208	97	496		
Maryland	18,640	30,907	32,708	34,509	77,184	18,458	30,109	34,358	24,609	76,003		
District of Columbia	2,687	5,374	5,685	5,996	13,187	2,672	5,518	6,402	7,160	19,911		
South Atlantic	56,717	90,783	95,796	100,796	236,756	116,918	206,748	239,347	194,106	571,063		
Florida	20,421	73,945	78,937	83,938	173,885	40,451	76,586	81,607	75,080	198,817		
North Carolina	21,811	116,038	125,053	130,058	287,807	113,815	119,987	129,517	128,940	366,368		
South Carolina	20,542	95,181	100,173	105,173	231,555	65,348	99,775	104,285	67,061	198,328		
Georgia	70,637	109,114	115,614	122,114	271,555	98,458	118,815	123,815	118,815	366,368		
Alabama	11,027	30,758	32,108	33,458	289,256	28,161	121,558	116,318	116,318	310,231		
West South Central	208,278	446,030	466,266	486,502	1,147,615	417,958	461,348	516,664	508,353	1,385,665		
Texas	20,748	135,517	143,718	151,919	366,113	64,551	143,993	158,397	131,849	341,755		
Oklahoma	13,379	114,118	121,318	128,518	333,667	59,458	119,987	129,517	128,940	366,368		
Illinois	33,759	77,519	80,927	84,335	185,841	80,290	128,996	161,485	134,317	339,733		
Michigan	13,659	89,912	94,346	98,780	221,159	46,484	91,999	98,031	87,723	207,806		
Wisconsin	16,686	77,083	80,491	83,899	236,113	59,458	119,987	129,517	128,940	366,368		
West North Central	166,126	512,029	532,713	553,302	1,201,455	398,257	505,239	557,284	611,708	1,495,804		
Minnesota	18,481	71,336	73,138	74,939	139,773	38,266	93,972	96,576	54,980	107,218		
Iowa	20,699	56,433	58,665	60,897	117,396	30,488	80,809	86,716	66,993	177,886		
Missouri	46,713	100,977	105,969	110,961	241,555	59,458	119,987	129,517	128,940	366,368		
North Dakota	3,413	8,880	9,317	9,754	13,393	8,458	27,857	28,318	1,635	7,941		
South Dakota	1,098	2,396	2,590	2,784	3,649	1,515	6,534	6,688	165	1,021		
Nebraska	2,561	5,453	5,647	5,841	7,700	2,816	5,518	6,402	7,160	19,911		
Kansas	8,697	12,919	13,278	13,637	38,209	37,738	43,658	44,658	2,809	86,231		
West North West	92,519	227,901	235,658	243,415	578,099	268,672	351,766	406,034	179,112	611,590		
Kentucky	21,378	51,777	56,080	58,412	128,763	35,598	68,888	71,242	60,635	159,515		
Tennessee	20,995	50,695	53,103	55,511	128,763	35,598	68,888	71,242	60,635	159,515		
Alabama	27,860	83,615	89,564	95,513	188,735	70,205	216,686	228,038	163,129	313,129		
Mississippi	18,028	59,926	63,338	66,746	148,580	37,569	52,569	56,569	39,291	54,291		
West South Central	208,278	446,030	466,266	486,502	1,147,615	417,958	461,348	516,664	508,353	1,385,665		
Louisiana	9,120	20,073	21,102	22,131	48,079	98,518	27,615	28,965	36,965	121,118		
Arkansas	2,413	8,880	9,317	9,754	13,393	8,458	27,857	28,318	1,635	7,941		
Oklahoma	4,977	10,767	11,229	11,691	20,087	9,968	20,338	21,681	36,736	39,390		
Indian Territory	28,328	56,057	57,220	58,383	89,885	109,398	57,178	58,340	28,740	29,877		
West North West	46,713	99,977	105,969	110,961	241,555	59,458	119,987	129,517	128,940	366,368		
Montana	4,311	9,307	10,181	10,662	14,774	9,307	20,338	21,681	36,736	39,390		
Idaho	1,401	1,908	1,719	1,830	3,125	14,388	12,872	13,231	348	87,612		
Wyoming	163	380	400	420	535	2,007	2,863	3,913	53	9,901		
Colorado	1,301	2,110	2,181	2,252	738	1,877	3,509	4,813	1,877	6,004		
New Mexico	188	290	266	292	55	8,057	7,768	8,077	164	15,999		
Arizona	3,828	4,179	4,194	4,209	8,414	41,794	15,501	15,800	1,519	38,953		
Nevada	967	710	760	810	1,000	5,686	1,811	1,811	881	11,817		
Nevada	113	143	153	163	382	672	455	476	68	9,901		
Mountain	7,558	9,917	10,771	11,625	19,714	89,558	69,619	71,007	3,709	163,126		
Washington	3,082	4,698	4,910	5,122	10,998	41,941	11,696	12,119	5,000	60,657		
Oregon	1,758	2,538	2,611	2,684	5,122	10,998	11,696	12,119	3,725	40,704		
California	30,810	28,757	29,519	30,281	70,764	232,665	80,106	80,106	20,000	20,000		
Pacific	35,626	38,213	39,361	40,509	99,665	109,412	106,908	110,194	39,535	451,855		
Continental U. S.	808,479	1,797,266	1,904,120	1,949,461	4,255,606	2,064,912	2,279,541	2,641,196	1,698,882	6,239,335		
Alaska	7,695	5,600	6,021	6,442	26,436	30,597	10,365	11,982	21,394	66,356		
Puerto Rico	27,056	13,512	12,272	11,032	68,470	39,778	18,095	15,803	72,850	72,850		
Territories	34,747	19,359	18,293	17,223	87,106	70,375	27,745	27,745	43,281	138,066		
Total: 1956-57	83,685	1,616,625	1,785,413	1,882,461	4,262,718	2,115,087	2,313,991	2,666,941	1,928,263	6,377,241		
1950-55	78,674	1,785,071	1,892,464	1,947,915	4,258,000	2,113,887	2,312,880	2,665,818	1,878,913	6,305,400		
1954-55	83,685	1,621,087	1,791,822	1,887,684	4,262,718	2,115,087	2,313,991	2,666,941	1,928,263	6,377,241		

Revised by addition of 739 tons of nitrogen to the Wyoming total.

(table 11). Consumption of primary nutrients was 322,061 tons (5.3%) more than that (6,055,480 tons, revised) of 1955-56. In 1956-57 the primary nutrient content of fertilizers comprised 2,135,287 tons of N, 2,303,991 tons of available P_2O_5 , 2,688,941 tons of total P_2O_5 , and 1,938,263 tons of K_2O .

Compared with the preceding year, consumption of these nutrients increased by 201,945 tons (10.4%) of N, 56,571 tons (2.5%) of available P_2O_5 , 25,523 tons (1.0%) of total P_2O_5 , and 63,545 tons (3.4%) of K_2O . The national weighted average of the total nutrient content of fertilizers containing these nutrients in 1956-57 was 29.30% as compared with 28.29% for the preceding year. Although the consumption of fertilizers containing these nutrients in 1956-57 was only 1.7% more than in 1955-56, the total quantity of primary nutrients was 5.3% more.

Mixtures comprised 67.6% of the total tonnage of primary nutrient fertilizers and supplied 39.5% of the N, 78.8% of the available P_2O_5 , 72.1% of the total P_2O_5 , and 86.8% of the K_2O . In the mixture used these nutrients were 5.9, 1.8, 1.4, and 1.7% higher than in the preceding year. While the tonnage of mixtures in 1956-57 was 0.5% lower than that in 1955-56, the total quantity of primary nutrients contained therein was 2.5% higher.

It has been shown in table 7 that the national weighted average of the total nutrient content of mixtures in 1956-57 was 29.54% as compared with 28.67% for the preceding year. Total nutrients supplied by mixtures were proportionally higher from the lower tonnage of mixtures.

The tonnage of materials containing primary nutrients for direct application comprised 32.4% of the total tonnage of this class of fertilizer and supplied 60.5% of the N, 21.2% of the available P_2O_5 , 27.9% of the total P_2O_5 , and 13.2% of the K_2O . The quantities of N, available P_2O_5 , and K_2O supplied by direct application materials were, respectively, 13.6, 5.4, and 16.4% higher (table 12) than in the preceding year, while that of total P_2O_5 was 0.3% lower. Although the tonnage of materials increased 6.6% over that in 1955-56, the total quantity of primary nutrients supplied thereby increased 11.9%. This is reflected in the national average of the total nutrient content of materials which was 28.81% in 1956-57, as compared with 27.44% (revised) for the preceding year. In 1956-57 the decrease in the tonnage of colloidal and phosphate rock was largely responsible for the decrease in the tonnage of total P_2O_5 supplied by materials. For the other classes of materials those supplying the major portion of the nutrients of their class were generally higher in 1956-57 than in the preceding year.

Though the national total of primary nutrients consumed was higher in 1956-57 than in 1955-56, of the 51 tabulated areas, there were decreases in the use of one or more of these nutrients supplied by either mixtures or materials in 39 (table 13). In 16 areas, however, the increase in the quantity of a nutrient supplied by either a mixture or a material was sufficiently higher to offset the decreased use of the respective nutrient in the other form. The remaining 23 areas are those in which the decrease in the nutrient in one category is not offset by an increase in the other category.

Such areas showing decreases numbered for N, 7; available P_2O_5 , 16; total P_2O_5 , 19; and K_2O , 13. Although these areas are scattered through all parts of the United States, the great-

er concentration was in the south-eastern part.

The national use of nitrogen increased 201,945 tons. Of this quantity, 154,992 tons (76.7%) was supplied by materials and 46,953 tons (23.3%) by mixtures. The increased consumption of nitrogen was largest in the West North Central region, followed by the South Atlantic, Pacific, and East North Central regions. While the consumption of nitrogen increased in all other regions, the quantity consumed in the form of materials in the East and West South Central regions increased but that used in mixtures decreased.

The national consumption of K_2O increased 63,545 tons—that used in materials by 36,036 tons, that in mixtures by 27,509 tons. The increased use was largely in the form of materials in the East North Central region (29,858 tons). In the South Atlantic region, the use in mixtures increased 15,083 tons and decreased 1,206 tons in materials. While consumption was generally higher in other areas, the use in both forms in the West South Central region was lower than in 1955-56.

The national use of available P_2O_5 increased 56,571 tons, while that of total P_2O_5 only 25,523 tons. The increased use of available P_2O_5 was largely in the West and East North Central regions. These areas accounted for 41,202 tons (72.8%) of the increased use and showed greater use in both mixtures and materials. While consumption of available P_2O_5 was higher in some of the remaining areas, total use in the South Atlantic and West Central regions was 8,761 tons lower than in 1955-56. The change in consumption of total P_2O_5 was much smaller than that of the available P_2O_5 due largely to the decrease in use of phosphate rock in which the content of P_2O_5 is considered as 3% available, and total as 32%.

The authors explain that data presented in tables 1 through 13 were compiled from information furnished by manufacturers showing the tonnage of each grade shipped to agents, dealers, and consumers in all the areas tabulated except California, Florida, Massachusetts, Missouri, North Carolina, South Carolina, Texas, and Virginia.

The data for these states were compiled chiefly from the reports of the fertilizer control officials of these states. Supplementary information was supplied by state agencies, as well as by fertilizer brokers. Special inquiries were made of all known distributors and custom applicators of anhydrous ammonia and nitrogen solutions.

"The quantities of N, P_2O_5 , and K_2O shown in this report are based on the average analyses of samples of the products by fertilizer control officials for the state in which they were consumed, rather than on the manufacturers' guarantees. Thus, the overruns or underruns of nutrients from the guarantees are taken into account. This gives more nearly the actual tonnage of nutrients consumed than the guarantees would," Mr. Scholl explains.

"The comparisons of the changes in fertilizer consumption are based on the tonnage of fertilizers containing primary nutrients, in order that a direct comparison may be made with the change in the quantities of N, P_2O_5 , and K_2O consumed," he adds.

Quantities are reported as 2,000-pound tons. Although the data refer to shipments, the terms "consumption", "sales", and "shipments" are used synonymously. Actual consumption differs slightly, no doubt, from either shipments or sales.

Data on consumption of fertilizers in U.S. possessions other than Hawaii and Puerto Rico, as noted, are difficult to obtain accurately and are insignificant when compared to the total for the U.S. For example, about 600 tons of fertilizers are being used annually in Alaska, but are not included in the report.

Table 12—Consumption of Direct-Application Materials

Material	Consumption			
	Year ended June 30		Change	
	1956	1957	Tons	Percent
MATERIALS SUPPLYING NITROGEN				
Nitrogen				
Ammonia, anhydrous	344,317	371,668	27,351	7.9
" , aqua	62,510	76,844	14,334	22.9
Ammonium nitrate	316,964	371,972	55,008	17.4
Ammonium nitrate-limestone mixtures	64,776	62,342	-2,434	-3.8
Ammonium sulfate	86,878	108,140	21,262	24.5
Bonemeal: raw and steamed	398	347	-51	-10.6
Calcium cyanamide	13,515	9,861	-3,654	-27.0
Calcium nitrate	8,630	7,796	-834	-9.7
Natural organics	13,204	13,133	-71	-0.5
Nitrogen solutions	34,493	75,241	40,748	118.1
Phosphate products	56,588	62,568	5,980	10.6
Potash products	3,153	1,480	-1,673	-53.1
Sodium nitrate	87,699	79,723	-7,976	-9.1
Urea	41,785	49,527	7,742	18.5
Other chemical nitrogen products	1,769	1,019	-750	-42.4
Total nitrogen	1,136,669	1,291,661	154,992	13.6
MATERIALS SUPPLYING AVAILABLE P_2O_5				
Available P_2O_5				
Ammonium phosphate: 11-48	23,265	30,997	7,732	33.2
" 13-39	16,568	17,850	1,282	7.7
Ammonium phosphate sulfate: 16-20	52,295	53,383	1,088	2.1
Ammonium phosphate nitrate: 27-14	844	1,595	751	89.0
Basic slag	14,115	13,350	-765	-5.4
Bonemeal: raw and steamed	3,244	2,884	-360	-11.1
Calcium metaphosphate	26,786	28,218	1,432	5.3
Diammonium phosphate: 21-53	7,523	10,667	3,144	41.8
Natural organics	9,740	10,799	1,059	10.9
Phosphate rock and colloidal phosphate	27,757	24,919	-2,838	-10.2
Phosphoric acid	7,515	9,400	1,885	25.1
Potash products	73	75	2	2.7
Superphosphate: 22% and under	122,500	112,096	-10,404	-8.5
over 22%	147,622	169,456	21,834	14.8
Other phosphates	2,500	1,677	-823	-32.9
Total available P_2O_5	462,347	487,366	25,019	5.4
MATERIALS SUPPLYING K_2O				
K_2O				
Cotton hull ashes	368	219	-149	-40.5
Lime-potash mixtures	1,418	1,939	521	36.7
Manure salts	246	346	100	40.6
Natural organics	5,758	8,699	2,941	51.1
Potassium chloride	194,754	227,400	32,646	16.8
" magnesium sulfate	1,480	1,704	224	15.1
" sodium nitrate	2,518	1,404	-1,114	-44.2
" sulfate	12,966	13,546	580	4.5
Tobacco stems	80	235	155	193.8
Wood ashes	129	108	-21	-16.3
Other potash products	89	202	113	127.0
Total K_2O	219,766	255,802	36,036	16.4

1/ Revised by adding 739 tons to Wyoming total.

Table 13—Changes in Consumption of Primary Nutrients

State and region	Mixtures				Materials			
	Available		Total	Total (N, avail. P_2O_5 , and K_2O)	Available		Total	Total (N, avail. P_2O_5 , and K_2O)
	N	P_2O_5	K_2O		N	P_2O_5	K_2O	
Maine	-1,283	-1,275	-1,635	-4,193	891	72	76	1,039
New Hampshire	219	425	350	1,094	203	-106	138	1,099
Vermont	383	859	804	2,046	168	-381	0	-153
Massachusetts	869	1,160	1,306	3,335	177	187	75	1,399
Rhode Island	148	208	275	631	42	13	10	265
Connecticut	675	1,275	1,517	3,467	78	-202	-102	-222
New England	951	2,773	2,504	6,228	1,531	-699	34	686
New York	1,838	3,158	3,197	8,193	680	500	444	1,485
New Jersey	39	425	147	611	310	9	-77	316
Pennsylvania	3	-1,060	-1,196	-2,253	392	23	-306	-872
Delaware	167	302	342	811	-143	31	40	-150
District of Columbia	-19	11	10	2	-17	-6	-5	-30
Maryland	31	230	1,177	1,438	134	3,640	138	3,912
West Virginia	25	-219	-388	-582	8	86	30	123
Middle Atlantic	2,454	3,770	3,534	9,758	1,425	774	290	3,069
Virginia	980	-609	-638	-267	1,277	963	143	1,267
North Carolina	-3,138	-10,821	-11,894	-25,853	7,775	-118	-45	7,612
South Carolina	609	-5,963	-4,361	-9,715	1,708	594	551	-649
Georgia	8,375	6,142	5,590	20,107	8,035	-5,105	-5,388	-2,458
Florida	9,528	9,522	10,058	29,108	1,064	-18	-5	4,971
South Atlantic	15,080	-2,192	-2,755	10,133	17,095	-4,347	-4,413	11,342
Ohio	3,644	2,124	787	6,555	3,197	2,373	8,058	7,356
Indiana	-186	316	674	904	7,250	3,366	13,773	22,389
Illinois	3,111	1,984	1,958	7,053	4,195	5,750	11,868	21,783
Michigan	4,509	2,064	2,076	8,649	3,510	2,841	306	1,019
Wisconsin	1,022	1,533	1,233	3,788	538	224	750	2,565
West North Central	12,007	8,595	6,708	27,310	18,023	11,719	-2,244	29,558
Minnesota	3,540	8,043	9,059	20,642	2,379	4,956	5,804	10,369
Iowa	467	515	1,504	2,486	6,100	201	303	6,552
Missouri	1,308	-742	-1,276	1,517	10,475	287	-10,030	1,709
North Dakota	1,365	1,775	1,490	4,650	1,347	1,105	0	2,390
South Dakota	89	55	60	204	131	-1,060	10	-1,087
Nebraska	381	1,435	1,953	3,769	13,363	4,126	4,215	17,770
Kansas	861	2,452	2,078	5,391	3,323	-2,280	-2,500	-150
West North Central	7,952	12,653	11,998	32,603	35,713	8,405	-4,273	49,832
Kentucky	1,244	1,086	1,137	3,467	1,898	-908	-1,720	-436
Tennessee	2,402	2,239	8,305	12,946	7,427	529	866	2,067
Alabama	-3,758	-2,629	-3,312	-9,699	-1,495	445	408	79
Mississippi	-1,022	-2,282	-2,421	-5,725	2,211	1,382	1,106	10,827
East South Central	-1,022	-1,653	-2,401	-5,076	6,105	12,215	8,079	13,345
Arkansas	-1,729	-2,496	-2,750	-6,975	-7,961	-1,308	-519	-1,696
Louisiana	-206	1,118	1,097	2,009	1,375	-1,863	-4,073	-1,887
Oklahoma	-718	-1,937	-1,937	-4,600	-3,327	-718	-2,736	-2,649
Texas	239	3,302	3,322	6,863	1,828	21,448	1,264	28,104
West South Central	-2,414	124	-778	-2,068	21,637	-2,346	-3,984	17,347
Montana	60	8	0	68	76	8,306	8,864	1,116
Idaho	647	641	709	1,997	1,359	2,664	1,629	4,347
Wyoming	-38	-184	-130	-352	-284	359	-361	3
Colorado	-38	-193	-199	-430	-177	3,186	1,373	1,766
New Mexico	-40	-40	-40	-120	-153	2,074	1,430	1,778
Arizona	991	1,246	1,297	3,534	2,506	4,806	597	5,910
Utah	56	133	118	307	210	660	698	17
Nevada	31	96	88	215	72	237	5	241
Mountain	1,669	1,596	1,679	4,944	3,696	13,783	8,384	23,863
Washington	297	-966	-945	-1,614	3,686	-1,150	-1,971	1,299
Oregon	244	465	530	1,239	911	1,410	1,473	3,794
California	3,426	2,863	2,787	9,076	7,702	10,528	-216	23,077
Pacific	4,797	2,902	2,772	10,471	7,770	27,100	-346	39,108
Continental U. S.	41,274	28,218	23,711	93,203	147,508	23,431	-4,128	23,477
Hawaii	-47	580	799	1,332	6,308	1,561	1,995	9,861
Puerto Rico	2,766	2,736	3,113	8,615	1,126	27	27	2,880
Territories	5,079	3,334	3,912	12,325	7,464	1,588	2,003	9,616
Total	46,953	31,552	27,603	106,108	154,992	25,019	-2,100	36,036

RESISTANT WHEAT STUDY

OKLAHOMA CITY—Oklahoma State University scientists, with the aid of the U.S. government, are seeking the development of state-adapted varieties of wheat and barley that will resist the greenbug. Entomologists are testing some 15,000 small grain samples from all over the world for greenbug resistance at the rate of

some 2,500 per year. Agronomists then take the resistant ones and cross them with varieties that possess top grade milling and baking qualities plus a high yield. Thus far in the experiments, the Ponca, an Oklahoma-recommended hard red winter variety, and Dickinson of North Dakota origin, have shown the most promise during breeding.

Quarantine Eased Against Japanese Beetle in East

WASHINGTON—Relatively light infestations of Japanese beetles in many areas of the eastern U.S. regulated by federal quarantine have made possible a change in the usual method of applying summer regulations designed to prevent spread of this pest, the U.S. Department of Agriculture says.

The modified regulations will not lessen the quarantine's effectiveness, according to USDA pest control officials, and they will give inspectors more time for location and appraising infestations and related hazards of insect spread.

During the season when the iridescent beetles are in flight—June to September—normal summer regulations will still apply in all regulated areas, but will be operative only when and where local inspectors find that beetle activity is hazardous to interstate movement of articles and means of transportation that may be infested.

USDA has notified state plant-pest control officials, farmers, processors, packers, shippers and carriers of changes in the regulations for 1958. Local inspectors will give carriers and shippers as much advance notice as possible whenever regulatory action is warranted.

This streamlining of quarantine enforcement concerns only restraints placed to prevent adult beetle spread; the year-round regulation of movement of soil and plants which might carry grubs or eggs of the pest continues unchanged.

In recent years, the summer regulations concerning Japanese beetles applied during specified dates in designated heavily infested areas—as determined the previous autumn—and to named hazardous articles and means of transportation. This more cumbersome procedure is no longer deemed necessary by USDA's Agricultural Research Service.

There is now no continuous area of heavy Japanese beetle infestation, as was once the case along the Atlantic coast from North Carolina to Massachusetts. Greatest danger of spread now is from scattered beetle concentrations, which will come under very close scrutiny. Improved pest-control methods, better crop processing and packaging and changes in transportation operations and vehicle design have in recent years cut the danger of spread of the adult beetles.

The pest is now found in parts of 15 coastal and adjacent states from Maine to Georgia, with some spotted infestations outside this area as far west as Missouri. Under federal quarantine are the District of Columbia and the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, Vermont, Virginia and West Virginia. The generally infested region equals about 6% of the area of the U.S.

Modified regulations tried out last summer proved effective in controlling movement of host products, vehicles and aircraft from beetle-infested areas. The additional changes this year are expected to put available funds and facilities to best use in preventing beetle spread from the "spotty" infestations anticipated.

The Japanese beetle lives in the soil as a root-feeding white grub for much of its life span. As grub and beetle, the pest attacks more than 200 agricultural and ornamental plants, causing damage of around \$10 million annually, USDA said.

Crops in Mid-South Make Good Progress; Insect Activity Noted

MEMPHIS—Arkansas cotton farmers are having relatively little insect trouble so far this season, according to Grover Dowell, extension entomologist.

He reports that live boll weevil counts were low in all areas of the state last week with the exception of southwest Arkansas. Mr. Dowell attributes this partly to the fact that cotton is of uniform age this year and that weevils are scattered over large areas and difficult to find.

Garden webworms are the most serious pest on cotton at this time and control measures are being applied. Aphids are present in many fields. Mr. Dowell says that beneficial insects are quite numerous in fields that have received no insecticide treatment. Bollworm eggs and larvae are present in many of the untreated fields but beneficial insects appear to have them under control. On the corn that has silked, earworm counts are high. European corn borer populations are heavy in east and southeast Arkansas.

Mississippi cotton farmers are experiencing quite a bit of trouble with

cotton pests. A. G. Bennett, extension entomologist, says farmers are poisoning older cotton for boll weevils and that bollworms are heavy in many fields over the state. The bollworms are destroying both small and large cotton squares, and Mr. Bennett says reinfestation will continue for some time.

County agents from all sections of the state report boll weevil infestations high enough to warrant immediate control measures. M. E. Hill, Humphreys county agent, says insects have been showing up in soybeans and that control measures are needed to protect the crop from severe damage.

Mid-South crops continue to make excellent progress thanks to frequent rains during the past week. W. C. Hamilton, Tishomingo County, Mississippi, agent, reports, "Crops never looked better at this time of year than they do now." Mississippi extension officials say that the rains have been sufficient to bring up late planted cotton and soybeans and to improve pastures.

C. A. Vines, associate extension director of Arkansas, says the rains were needed but that additional moisture at this time would damage cotton and soybeans. The rice crop is in

excellent condition and free of grass.

West Tennessee crop conditions are generally improved but a general rain is needed in most areas. H. T. Short, West Tennessee extension agent, reports improvement in soybeans, cotton and summer pastures.

David M. Coleman Joins Michigan Chemical Corp.

SAINT LOUIS, MICH. — Michigan Chemical Corp. has announced the appointment, effective June 2, of David M. Coleman to its chemical sales staff. Mr. Coleman comes to his new assignment from Olin Mathieson Chemical Corp. where he served in various sales capacities. Prior to that association, he was employed for six years by Hooker Electrochemical Co.

FILBERT PESTS

CORVALLIS, ORE. — "Filbert Insect Pests," written by Oregon State College extension service workers, has been published by the college. More than a dozen major pests are reviewed with illustrations of insects and the damage they do, along with spray and dust control recommendations.

Books on Pesticides

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Croplife

A WEEKLY NEWSPAPER FOR THE FARM CHEMICAL INDUSTRY

The regional circulation of this issue is concentrated in the Western states.

1956-57 FIGURES ANNOUNCED . . .

USDA Reports Fertilizer Consumption Up 1.7% Due to Increase in Use of Materials

A SLIGHT increase in total fertilizer consumption in the 1956-57 year ending June 30, 1957 is reported in this issue of Croplife. According to Walter Scholl and his associates who compile these figures each year, the total quantity of various kinds of fertilizers consumed last year came to 22,709,011 tons, which was a gain of 1.7% over the 21,404,365 tons accounted for in the previous fertilizer year.

The fertilizer industry always looks with interest to see in what areas gains and losses in useage have occurred. Last year, the greatest gains in actual tons consumed, were registered in the Pacific states of Washington, Oregon, and California. These three states upped their use of mixtures some 39,240 tons, and their consumption of materials by 102,596 tons, to mark the largest tonnage gains in the U.S. The percentages of gain were 12.7 and 8% respectively.

The mountain states of Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah and Nevada came through with the greatest percentage gains, however, with a 17.8% increase in mixtures and 20% gain in materials. The tonnage increases were 8,514 and 61,314 tons respectively.

Significant increases in the use of both mixtures and materials in the West North Central states of Minnesota, Iowa, Missouri, North and South Dakota, Nebraska and Kansas were recorded, also. In these states, mixtures showed a gain of 38,322 tons and materials 80,429 tons, which registered percentage increases of 3.2% and 9.1% respectively.

As might be expected, in view of the soil bank and unfavorable weather conditions last year, the South Atlantic states of Virginia, North and South Carolina, Georgia and Florida suffered the greatest reductions in use of fertilizers. This group used 27,089 fewer tons of mixed goods than it did the year before, and 9,653 tons less of materials.

Both the East South Central states (Kentucky, Tennessee, Alabama and Mississippi) and the West South Central states (Arkansas, Louisiana, Oklahoma and Texas) also showed considerable reductions in their use of mixed goods, but both groups increased their consumption of materials.

The East South Central group used 69,110 fewer tons of mixed goods, but 41,228 more tons of materials, while the figures for the West South Central group were minus 70,615 tons and plus 19,639 tons, respectively, for mixed goods and materials.

The significance of these figures will be viewed in varying degrees of apprehension, or elation, as the case may be. The fact that use of mixed fertilizers was reduced in some areas certainly does not herald the end of this method of fertilization, nor does the increase in application of materials alone necessarily indicate an overall swing in that direction.

The report says that the main changes in consumption of direct application materials lay in the field of nitrogenous products. Both dry and non-dry materials rated high in the increases registered. In actual volume, ammonium nitrate increased the most, with a gain of 164,530 tons, which amounted to a 17.5% increase. Nitrogen solutions were not far behind with an increase of 136,983 tons, but percentagewise, their gain was spectacular: 125.8%. Urea also registered impressive gains with an increase of 16,543 tons for a 17.9% jump.

Aqua ammonia went up 71,484 tons for an increase of 23.1%, and anhydrous ammonia 33,348 tons, or 8% above the consumption figures of the previous fiscal year. Ammonium sulfate enjoyed a big increase in use also, its total tonnage being 101,785 tons greater than previous year, amounting to an increase of 24.6%.

Losses were registered by ammonium nitrate-lime mixtures (-4.2%), calcium cyanamide (-28.6%), calcium nitrate (-9.1%) and sodium nitrate (-9.1%).

In the area of phosphate consumption, the report says that these materials declined in use by some 62,352 tons, or 2.5%. Principal areas of reduction of colloidal and phosphate rock were in Illinois and Missouri. However, the figures show that use of grades of superphosphate containing over 22% P₂O₅ increased by some 48,246 tons or 14.8%. "It appeared that more superphosphate was used, rather than higher grades being substituted for lower grades," the report states.

Potash materials used in direct application showed an increase when compared with the consumption in the preceding year, the figures show. The compilers note that the reduction in use of potassium-sodium nitrate (from 20,680 tons to 9,373 tons) may be partly the result of some of this product being reported as a mixture, since the increase in use of mixtures corresponding to grades of this product would nearly account for the decrease in tonnage.

Use of 58-62% grades potassium chloride increased from 309,230 tons in 1955-56 to 370,531 tons last year.

All of these figures outlined here represent only a surface-scratching of the wealth of information contained in the entire report. We hope that our readers will go through the charts, tables, and text carefully and, from the comparative figures, determine the trends being taken in the fertilizer industry.

Of significance, we think, are the increases in total plant nutrients, continuing emphasis on application of separate materials, and the rise in consumption of non-dry materials.

Also worthy of note is the continually-increasing use of fertilizers of all kinds in the midwest and western regions of the U.S. In the mid-section of the country, where the soil has retained its natural fertility longer than in some other areas, farmers were for many years cool to the idea of adding large amounts of fertilizers. Now, however, the tide is turning rapidly and growers are realizing that big harvests remove great quantities of plant nutrients, and that these elements must be replaced not only to maintain, but also to increase soil fertility.

The far west has been maintaining a hard-to-beat pace in fertilizer consumption over the past several years. It registered highly significant gains this past year on top of the previous increases which have been notable for a number of seasons. Maybe the heavy use of fertilizer materials becomes a habit because it is so profitable. If that should be the case, all we need, apparently, are more people to get into the habit.

Continuing efforts to merchandise and sell are the answers to these problems. The responsibility for this rests on everyone associated with the industry . . . from basic producer down to the dealer who is the final link in the merchandising chain.



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CROPLIFE is a controlled circulation journal published weekly. Weekly distribution of each issue is made to the fertilizer manufacturers, pesticide formulators and basic chemical manufacturers. In addition, the dealer-distributor-farm adviser segment of the agricultural chemical industry is covered on a regional (crop-area) basis with a mailing schedule which covers consecutively, one each week, four geographic regions (Northeast, South, Midwest and West) of the U.S. with one of four regional dealer issues. To those not eligible for this controlled distribution Croplife subscription rate is \$5 for one year (\$8 a year outside the U.S.). Single copy price, 25¢.

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MEETING MEMOS

July 1-10—Georgia Fertilizer Meetings Sponsored by the Georgia Plant Food Educational Society; July 1, W. H. Norris Farm, Pike County; July 2, T. B. McDowell & Sons, Dougherty County; July 9, Ernest Nunn Farm, Jackson County; July 10, Banks Dairy Farm, Bulloch County.

July 8-10—Pacific Northwest Plant Food Assn., Ninth Annual Regional Fertilizer Conference, Pocatello, Idaho.

July 11-12—Pacific Northwest Section, American Society of Range Management, Summer Meeting, Kamloops, B.C.

July 13-16—American Society of Agronomy, Northeast Branch, Cornell University, Ithaca, N.Y.

July 13-15—Plant Food Institute of Virginia and North Carolina, Summer meeting, Cavalier Hotel, Raleigh, N.C.

July 16-19—Southwest Fertilizer Conference and Grade Hearing, Buccaneer Hotel, Galveston, Texas.

July 24—West Virginia University Agronomy Field Day, Ohio Valley Experiment Station, Point Pleasant, W.Va.

July 27-29—New Mexico Grain and Feed Dealers Assn., Summer Meeting, Hotel Clovis, Clovis, N.M.; Parley Jensen, P.O. Box 616, Albuquerque, N.M., Assistant Secretary.

July 29-30—Annual Fertilizer Industry Conference Sponsored by the Alabama Polytechnic Institute Experiment Station; Black Belt Substation near Marion Junction, Ala. (July 29) and Prattville, Ala. Experiment Field (July 30).

July 30—Kentucky Fertilizer Conference, Greenville, Ky.

Aug. 4—National Joint Committee on Fertilizer Application, Annual Meeting, Purdue University, Lafayette, Ind.

Aug. 4-8—American Society of Agronomy, Annual Meeting, Purdue University, Lafayette, Ind.

Aug. 12-13—Ohio Pesticide Institute, Summer Field Tour, Ohio Agricultural Experiment Station, Wooster, Ohio, J. D. Wilson, Ohio Agricultural Experiment Station, Wooster, Institute Secretary.

Aug. 12-14—Beltsville Cotton Mechanization Conference, Civic Auditorium, Brownsville, Texas; Sponsored by the National Cotton Council.

Aug. 20-24—Canada Fertilizer Assn. (formerly Plant Food Producers of Eastern Canada), Annual Meeting, Manoir Richelieu, Murray Bay, Quebec.

Sept. 4—Grassland Field Day, Rutgers University Dairy Research Farm, Beersville, N.J.

Oct. 14-15—Western Agricultural Chemicals Assn., Annual Meeting, Villa Hotel, San Mateo, Cal., C. O. Barnard, 2466 Kenwood Ave., San Jose 28, Cal., Executive Secretary.

Oct. 20—Annual Sales Clinic of Salesmen's Assn. of the American Chemical Industry, Inc., Roosevelt Hotel, New York.

Oct. 20-21—Fertilizer Section, National Safety Council, annual fall meeting, La Salle Hotel, Chicago, Ill.

Oct. 22-24—Pacific Northwest Plant Food Assn., Annual Meeting, Gearhart, Ore., Leon S. Jackson, P.O. Box 4623, Sellwood-Moreland Station, Portland, Ore., secretary.

Oct. 28-29—Northwest Garden Supply Trade Show, Masonic Temple, Portland, Ore.

Oct. 29-31—Fertilizer Industry Round Table, Sheraton Park Hotel, Washington, D.C.

Oct. 29-31—National Agricultural Chemicals Assn., 25th annual meeting, Bon Air Hotel, Augusta, Ga.

Nov. 9-11—California Fertilizer Assn., 35th Annual Convention, Ambassador Hotel, Los Angeles, Sidney H. Bierly, 475 Huntington Drive, San Marino 9, Cal., General Manager.

Nov. 10-11—Agricultural Aviation Research Conference, Milwaukee.

Nov. 18-20—Washington State Weed Conference, Moses Lake, Wash.

Nov. 24-25—Entomological Society of America, Eastern Branch, Annual Meeting, Lord Baltimore Hotel, Baltimore.

Dec. 1-4—Entomological Society of America, Annual Meeting, Hotel Utah, Salt Lake City.

Dec. 3-4—North Central Weed Control Conference, Netherland Hilton Hotel, Cincinnati.

Dec. 3-5—Agricultural Ammonia Institute, Annual Meeting, Morrison Hotel, Chicago, Jack F. Criswell, Claridge Hotel, Memphis, Executive Vice President.

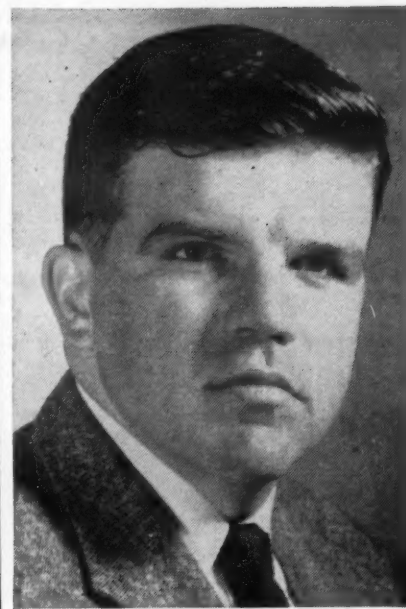
Dec. 9-11—Chemical Specialties Manufacturers Assn., Annual Meeting, Commodore Hotel, New York.

Dec. 17-18—Beltwide Cotton Production Conference, Rice Hotel, Houston, Texas, sponsored by the National Cotton Council.

Jan. 20-22, 1959—California Weed Conference, Santa Barbara, Cal.

North Carolina Sales

RALEIGH, N.C.—April fertilizer sales in North Carolina totaled 412,516 tons, down from 486,042 tons in April, 1957, the North Carolina Department of Agriculture reports. Sales for the July-April period of this fiscal year amounted to 1,051,595 tons, a decrease from 1,239,090 tons in the comparable months a year earlier.



John W. Keays

JOINS CRAG—Appointment of John W. Keays to the Crag agricultural chemicals department, White Plains, N.Y., has been announced by Union Carbide Chemicals Co., division of Union Carbide Corporation. Mr. Keays will be a member of the department's newly-formed product development group, and will assist in the market development of new Crag Sevin insecticide. He was formerly located at Boyce Thompson Institute for Plant Research, Yonkers, N.Y., where he assisted in laboratory and field evaluations of Sevin.

OFFERS FLUORIDES

RICHMOND, CAL.—United-Heckathorn has announced production of fluoride compounds from domestic raw materials at its plant near Salt Lake City, Utah. The firm offers on long-term supply contracts, cryolite, ammonium fluoride, ammonium bifluoride, sodium fluoride and aluminum fluoride, all of which are produced by a basic new process.

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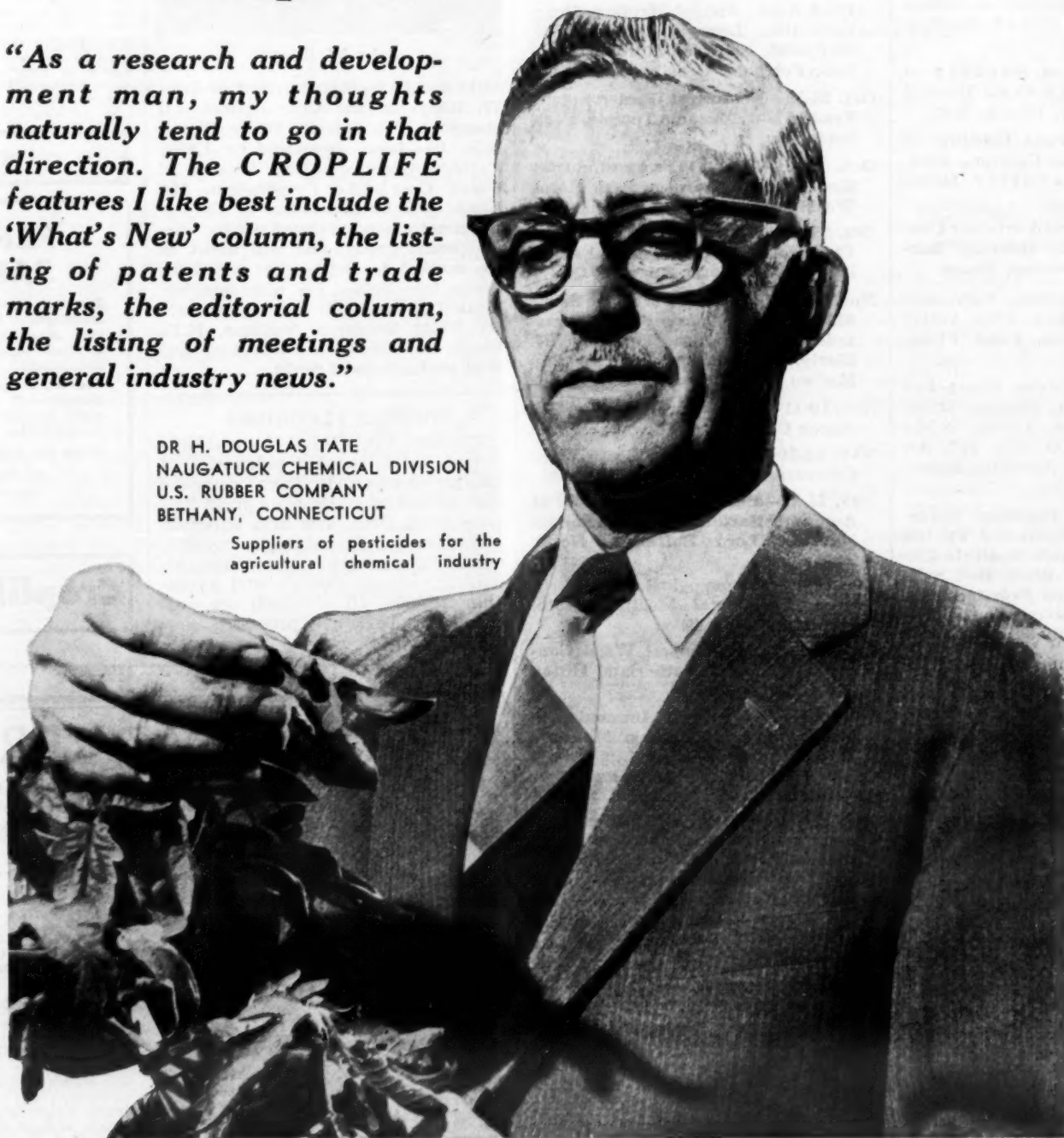
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